Pests

AND THEIR CONTROL

1941

SEPTEMBER

VOL. 9 NO. 9

ORGAN OF THE PEST CONTROL INDUSTRY

Exterminators
Fumigators
Termite Control Operators
Entomologists
Insecticide and Supply Mfgrs.

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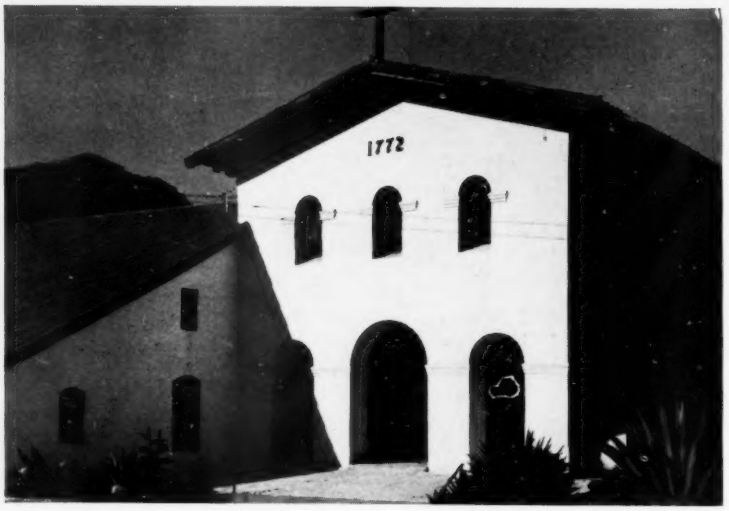

Mission San Luis Obispo

Death Valley

Lake Tahoe

Pests

and Their CONTROL

Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

COOPERATING WITH NATIONAL PEST CONTROL ASSOCIATION

AL COSSETTA, *Editor*
D. E. RECK, *Associate Editor*

MAX ROSENTHAL, *National Advertising Rep.*
126 Lexington Ave., N. Y. City, Phone Mu. 4-9000

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NATIONAL PEST CONTROL ASSOCIATION, INC.

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Three classes of membership: Active, Associated and Allied. ACTIVE MEMBERSHIP includes all firms engaged in any type of Pest Control operations (general extermination, fumigation, termite control, moth proofing) and dues are $15.00 per year. ASSOCIATE MEMBERSHIP includes branch offices of Active members and yearly dues are $10.00. ALLIED MEMBERSHIP includes manufacturers and supply houses.

STATEMENT

The National Association appreciates the co-operation given by way of publicity. The Association is not responsible for articles published unless credited to the Association. The list of officers and directors is published for informational purposes only.

For further details, communicate with
WILLIAM O. BUETTNER, *Secretary*
3019 Fort Hamilton Parkway — **Brooklyn, New York**

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"Contributed articles in this publication do not necessarily reflect the opinions of the editors. The editors invite discussions, comments and all types of literary material pertaining to pest control and pests from any person interested in the advancement of the field."

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EDITORIAL

Maintenance Services Defined

UNECONOMIC price situations, slavish imitation of competitive advertising copy, inefficient pest control service operations on the part of some PCOs, all are objective manifestations of a form of guerrilla civil war within the household and structural pest control industry. These industry disruptions, which have obtained on sufficient occasion to be of concern to all, spring in part, we think, from the lack of a universally accepted and recognized minimum set of ethical standards based on a breakdown by definition of the divers pest control services. The N.P.C.A.—always quick in suggestion and ready in resource—has set in motion to date several such formulas, now familiar to most: Subterranean Termite Control-1-2-3-3½ fundamental principles; Good Domestic Fumigation Practices; Fundamentals of Rat Control.

Amplification of what is meant by regular pest control maintenance service so that the public may know what to expect concretely and definitely when a pest control firm makes an agreement to provide periodic, monthly, semi-monthly, etc. services, is contained in N.P.C.A. Service Letter 211*. The impelling need for maintenance service standards is further crystalized in a letter from Dad Alderman, President of the N.P.C.A. to Bill Buettner, its Secretary. We are pleased to be able to reproduce it since it offers much of value on this constructive and vital subject:

"I wonder if even you realize the immensity of the subject that you have brought up? We changed the name of our service from "Exterminator" to "Control" because the better element in our membership realized that our business was control, or in other words, maintenance.

Two-thirds of our discussions in the various conferences and in your service letters, have to do with some phase of maintenance. I have long maintained the hope that as we approach closer in agreement upon methods and practices in various forms of pest control, that we would create standards. Take for illustration: Household Pest Control. It breaks down into three or four methods of control. **Number one**—is a cleanup by an operator and periodical thorough re-inspections by his own employees. This operation might be classified as standard. **Number two**—the operator makes a cleanup and then depends for future information upon the janitor or tenant, or in other words, he uses an amateur for his inspection. **Number three**—the operator visits the job periodically leaving insect powder to be applied by the servants, or in this case, he employs an amateur to perform the service—Not too good.

Here are three grades of service in a descending scale and at the present time they are competing on an even basis for business. This problem is to educate the public to the difference in the quality of the service he buys. Exactly as all lines of trade do by various means of public education.

I think you realize, Bill, that this ties in with all that you and I and other earnest operators are attempting to do. What would you think of attempting to agree upon the minimum specifications of what would be known as a standard pest control job? Have we ability to put this idea across to the public? This, of course, is what each individual firm attempts to do by personal reputation.

In selling a pest control service especially insect control in structures, nothing is more unfair to both the owner and operator than a blanket protection. A thorough inspection by a competent operator should disclose all insects and vermin then present. Contracts for control should group insects controlled by the same remedy and the contract should definitely state that should rodents, bedbugs, or other vermin requiring special treatment, appear later, this would constitute a new and additional service.

The most important phase of a control or maintenance service is the manner in which the job is sold. We do not pay enough attention to training our salesmen to thoroughly acquaint the customer with what we can and cannot do and enlisting his co-operation."

Non-members of the N.P.C.A. may receive without obligation a copy of this Service Letter by writing W. O. Buettner, Secretary, N.P.C.A., 3019 Ft. Hamilton Parkway, Brooklyn, N. Y.

Carbon Copy Advertising: Is It In Your Best Interests?

IF THE present trend toward regimentation of advertising copy on the part of termite control operators continues, it will inevitably lead—as is already evidenced—to such promotional effort being keyed to the tempo of the lowest common denominator practices of the unethical operator with the result that business will gravitate to the most expert in the use of the flowery phrase and the exaggerated statement, rather than to the operator with a termite control service of intrinsic value for the buyer.

A recent declaration on this phase of industry-public relations, by one of its good friends, is of prime interest and first importance at this time. He says: "The policy of standing on your own feet and ignoring unethical competitors *can* be successful."

Not having been entirely immune to the potency of price as an expedient in sales stimulation; and to the temptation of carbon-copying competitive offers in order to leave nothing to chance on the vital question of greater sales potential, nevertheless, we sincerely believe the recommended course of standing on one's own feet has within it the seed for the birth of a policy to control a situation which otherwise may easily become a bottleneck in the progress of the industry. In short, unless the tendency is reversed, the effect will be to leave the average buyer little choice in the proper selection of his pest control service needs other than a choice predicated on a set of inferior standards.

N.P.C.A. vs. New York World-Telegram on Use of Vitamin B-1 As a Rat-Bait Attractant

TWO divergent observations of recent note, one scientific in tenor, the other obscurant in essense, concern the possible use of Vit. B-1 as a rat-bait-attractant. The first appeared in the N.P.C.A. Service Letter of May 20, 1941, the second appeared as an editorial in the Scripps-

Howard-New York-World-Telegram under date of June 22. Both reappear here in the respective order:

Do You Eat Salt?

"There is no question but that many individuals always add a little bit of salt to their food and the suggestion has been made that possibly rats might desire to have a little salt put on their own food. In the preparation of your baits the next time, why not try a little salt just as you would put it on your own food? We shall be pleased to learn of your experience.

Another suggestion that has been mentioned is the value of Vitamin B-1 as found in yeast. It is possible that the addition of some value of this vitamin to a bait may have good results."

Science?

"For a new high of silliness in the current vitamin craze, we cite the latest suggestion of the National Pest Control Association:

That if the rats on your premises are refusing to get caught in your traps, perhaps you should make the bait more tasty by salting the cheese, and if that fails you might try "experimenting with the possibilities of Vitamin B-1 as an attractant."

It is evident the fissure between the two points of view may be summed up in language approximately as follows: The N.P.C.A. says, in effect—there may be something to the use of Vit. B-1 as a rat-bait-attractant, but since it does not know definitely, suggests experimental endeavor along such lines on the part of its membership. The World Telegram editor says, in effect—the whole idea is silly, and *therefore* (he offers nothing else to substantiate his generalization) concludes, there's no point in attempting any exploratory effort.

Can it be that the conscience of the Scripps-Howard pundit was prodding him when he headlined his effusion: "SCIENCE" with a question mark after it; for in so doing, it seems to this minority of one, he was nameplating (unintentionally, of course) his own unscientific turn of mind rather than the sensible suggestion of the N.P.C.A.? At any rate, it's a thought.

Sodium Fluoride

SODIUM fluoride is scarce. In the light of this scarcity, pest control operators are being advised to use less fluoride in their roach powders and to increase the proportion of other ingredients. In one case, it is suggested that those operators—and the same applies to insecticide manufacturers where container labels can be changed conveniently—who have been using straight fluoride or a three-to-one fluoride-pyrethrum mixture, cut the fluoride content. Three-to-one fluoride pyrethrum can be made a fifty-fifty mixture, or if this is too costly, the difference can be made up by the addition of clay, flour, or some other inert substance. Borax cannot be recommended because this also is scarce and becoming increasingly hard to get.

For a roach powder, some operators and entomologists maintain that fifty per cent fluoride is sufficient and that straight fluoride is not necessary to do a good roach job. So, now seems to be the time to check over your roach powder formula with the idea of using more pyrethrum, or rotenone products to make your supplies of fluoride go further.

—Soap and Sanitary Chemicals, August issue, 1941.

Annual Meeting of American Public Health Association

Preliminary Program of the Scientific Sessions of the 70th Annual Meeting of the American Public Health Association, and Meeting of Related Organizations, and of the Eighth Institute on Public Health Education will be held at Atlantic City, New Jersey, October 11-17, 1941.

The following item regarding the National Pest Control Association appeared in the American Journal of Public Health:

"The National Pest Control Association comprising over 400 of the leading firms of the United States and foreign countries have nothing to sell except good will. Purpose of the exhibit is to present an educational display of household and structural pests, damages done, and provide information which will be helpful to Public Health Officials. In attendance at the exhibit will be entomologists, chemists and commercial pest control operators (exterminators, fumigators, termite control operators) who will be prepared to answer questions."

Those who can attend, should by all means take advantage of this important meeting.

To Keep UP-to-the-Minute on Latest Developments in Pest Control . . .

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Ninth Annual Convention

St. Francis Hotel—San Francisco, Calif.

Monday, Tuesday, Wednesday, October 27-28-29, 1941

Theme: **"I've Got a Pest"**

IN SHORT, the hub of the wheel is **the pest** and the spokes form the various subjects to be tied in with the essential rim of a satisfied public looking toward the competent PCO performing satisfactory services. (This theme idea will appear as a wheel and printed on the program.)

"I've Got a Pest"

As indicated, we are using the wheel with its spokes, and thinking in terms of our Ninth Annual Convention. There are **nine** principal spokes around which addresses, discussions, etc., will take place. Addresses and papers are to be short with maximum time given for a well directed discussion along "questions and answers," and those participating to bring something definite by way of experiences, etc. The significance of nine spokes will recall our Ninth Annual Convention.

The Spokes

1. Common Household Insects and Pests.
   (Roaches, bedbugs, moths, silverfish, ants, rats, mice, carpet beetles.)
2. Termites, Wood Boring Insects, and Fungi.
3. Fumigants and Unusual Insects and Pests.
4. Public Relations.
   (Advertising, modern pictures, publicity, bulletins, management relationships, cooperation with agencies.)
5. Business Practices or *Our Profession.*
   (Cost-analysis, office problems, employee relations, insurance.)
6. National Defense in Relation to Pest Control.
   (New avenues, sanitation, consultant work.)
7. Legislation.
   (Model ordinance or law; some present laws and trends.)
8. Research.
   (An enlarged program—state and national.)
9. Products and Supplies.
   (Chemistry of insecticides — manufacturers' findings and trends.)

All of these spokes tie into the rim that brings together united efforts to utilize information in a consistent manner—standards or a "formula" of what constitues adequate, intelligent and satisfactory work.

The Program

EDITOR'S NOTE: *In releasing the Convention outline for publication at this time the N.P.C.A. wishes to explain that though every effort will be made to carry the program through as indicated, some slight changes due to unforeseen circumstances may develop on or before Convention time. Such changes, if any, will be announced in advance through the regular channels, time permitting.*

Monday Morning—October 27, 1941

Registration—(8:30 to 9:30)

Convention Called to Order at 9:30 A. M.—F. E. Bohman, General Chairman.

Invocation—(Clergyman to be invited by Charles Menard.)

San Francisco Welcomes the Convention—The Honorable Mayor (Introduced by Charles Menard, Local Chairman).

The Pest Control Industry Replies—C. Norman Dold.

President's Annual Address—L. R. Alderman.

Secretary's Annual Report—William O. Buettner.

Treasurer's Annual Report—Albert M. Akers.

Memorial Service—H. K. Steckel.

Distinguished Visitors and Guests Introduced—William O. Buettner.

Address — Chief of Bureau or Assistant Chief, Representative, Bureau of Entomology and Plant Quarantine.

Committee Reports — Chairmen of Committees. (Committees should be prepared to include recommendations which will be introduced as motions for subsequent consideration at the business session of the Convention. Opportunity will also be given to discuss some of these matters as time permits.)

Monday Afternoon—October 27, 1941

(Reconvenes Promptly at 2 P. M.)

Spoke No. 1—"Common Household Insects and Pests"—J. J. Davis, Chairman; Al Forde; Robert E. Hackley. (This program to be developed by J. J. Davis using such persons as may be able to contribute practical experiences.)

Spoke No. 7 (About 4:15 P. M.)—"Legislation"—William O. Buettner, Chairman; William Hogan; H. K. Steckel; Max J. Levy.

Address—Dr. Alvin Cox.

Tuesday Morning—October 28, 1941

(Session Opens at 9 A. M.)

Spoke No. 2—"Termites, Woodboring Insects and Fungi"—F. K. Harder, Chairman; Wayne Davis; W. Burgin; Ernest Barber; J. R. Franklin. (If it is possible to include Dr. Light as a speaker or if Dr. Snyder is to be in attendance, and we hope he is, there should be a brief address.)

Spoke No. 6 (About 11:15 A. M.)—"National Defense in Relation to Pest Control" — George A. Rader, Chairman. (Prefer a representative from Army who will outline sanitary measures, etc. —speaker to be procured by Charles Menard and Local Committee.)

Tuesday Afternoon—October 28, 1941

(Session Reconvenes at 2 P. M.)

Spoke No. 4—"Public Relations"—Chairman (to be selected by Local Committee, West Coast Representative); Morton Prescott; Harold Davies; Louis Gatto.

"We Sell Pest Control Service"—(A demonstration to be arranged by West Coast men.)

"Possibly a Representative from Property Management"—Mr. Eugene Fritz has been strongly recommended.

Address—"Public Health and Pest Control" —By Dr. J. C. Geiger.

Spoke No. 8 (About 4:15 P. M.)—"Research"—P. Calvert Cissell, Chairman; William O. Buettner. (Summary of endeavors thus far made and future program. Preferably some state entomologist who can show how the industry can bring about appropriations through state legislatures.)

Wednesday Morning—October 29, 1941

(Session Opens at 9:00 A. M.)

Spoke No. 5—"Business Practices or Our Profession"—Jess M. Miller, Chairman; Louis Kotler; G. Ray Lovejoy; John Vogel; R. C. Yeager. (Any speaker who the Chairman feels may add to this program—perhaps a good insurance man would be available.)

Business Session, 11:00 A. M.—

a. Unfinished business.
b. Amendments to Constitution and By-Laws (if any).
c. New business.
d. Report of Nominating Committee.
e. Election of officers and directors, October, 1941, to October, 1942.

Wednesday Afternoon—October 29, 1941

(Session Reconvenes at 2:15 P. M.)

Spoke No. 9—"Products and Supplies"—Chairman (Local Chairman and his Committee to appoint this man); Martin T. Meyer.

Address—Esler Johnson. (The main subject matter has to do with inviting manufacturers and supply houses to explain any new research and experience with products and equipment.)

Spoke No. 3 (About 4:15 P. M.)—"Fumigants and Unusual Insects"—Robert Loibl, Chairman; J. J. Davis; Chas. W. Houghton.

LUNCHEONS AND SPECIAL EVENTS

Sunday Evening, 6:30 P. M.—Board of Directors and any who are at the hotel make "dutch-treat" reservations for dinner, and immediately following the dinner the Board of Directors holds its annual meeting.

Sunday Evening, Beginning About 9:30 P. M.—Open House; "PCO Order of Standbys"—President's Suite. Everyone invited.

Monday, 12:15 P. M.—Luncheon, Ernest G. Mills, Chairman. Speakers: Professor Wm. B. Herms and Dr. G. F. MacLeod.

Tuesday, 12:15 P. M.—Luncheon. East and Midwest to provide speaker. J. Harvey Sturgeon, Chairman. (We suggest a "Truth and Consequences" Quiz.)

Wednesday, 12:15 P. M.—No special luncheon arranged.

ENTERTAINMENT

We are purposely not including the entertainment features except that on Monday evening greatest emphasis is to be placed on introduction of Booth Exhibitors and possibly interesting motion pictures.

LADIES' PROGRAM

Mrs. Mildred Montgomery has submitted the following and here again she would welcome constructive criticism:

Sunday

(Not Included in Convention Fees)

In view of the fact that "Exposition Flyer" arrives Saturday evening and many will have arrived on Sunday, informal pay-as-you-go events are in order.

2:00 to 5:00 P. M.—Tour of East Bay for men and women attending Convention.

Monday

12:00 to 1:30 P. M.—Luncheon with the men at Hotel St. Francis.

2:00 to 5:00 P. M.—Guided tour of Chinatown, leaving from Post Street entrance of St. Francis Hotel. Tea in Chinatown included in tour.

— or —

2:00 to 5:00 P. M.—Those wishing may play cards at the Hotel. (Indicate any other events if there are suggestions.)

Evening—Du Pont Party.

Tuesday

10:00 A. M. to 5:00 P. M.—Bus tour of San Francisco, leaving from the Hotel. This tour will include luncheon at the world famous Cliff House overlooking the Golden Gate, views of the Golden Gate Bridge, the Oakland Bay Bridge and many other points of interest.

Wednesday

12:00 to 1:30 P. M.—Fashion Show and Luncheon at Cliff Hotel.

6:30 P. M.—Banquet at Hotel St. Francis.

H.P.C.A. Travel Information

"Tourist Travel" from either St. Louis or Chicago is recommended in that accommodations will be found to be very comfortable. Such travel is often referred to as "First-Intermediate Rail Ticket" so that as standard lower berth sleepers are required to either St. Louis or Chicago, the remainder of the trip will be via tourist lower berths. It you prefer upper berths, the rate for such berth is approximately 20% cheaper. Who can tell, some may even be satisfied with "coach travel" all the way? From some who have travelled that way, they claim they enjoyed it.

We have been asked concerning the use of the "Travel Credit Plan." Your local station agent will gladly give you the figures but off hand on the basis of twelve monthly installments and using three cities as examples (round trip fare and lower berth to San Francisco):

a. New York (First-Intermediate) Total $156.65 plus charges for Travel Credit of $10.97.

b. Atlanta (First-Intermediate) Total $118.60 plus charges for Travel Credit of $9.49.

c. St. Louis (First-Intermediate) Total $88.00 plus charges for Travel Credit of $6.84.

The monthly installments respectively would be $13.96, $10.67 and $7.90 the first eleven months and the difference met with the 12th installment or respectively for the cities mentioned $14.06, $10.72 and $7.94.

And from Martin Meyer, Chairman of the Travel and Transportation Committee (213 So. 10th St., Philadelphia, Pa.), comes a few items that we pass along:

(a) "Request for Information" cards may be procured from Martin Meyer so that those travelling by car might have their itineraries prepared by either or both the Standard Oil Travel Service or the Shell Oil Touring Service. Write Martin for these cards if you desire to have your trip planned, marking best roads, detours, hotels, etc. No charge for this and an appreciated courtesy extended our Association.

(b) Rail Travel on Credit: This was commented upon in an article appearing in PESTS. We will not attempt to give examples except pos-

Rail Fares—Ninth Annual Convention

The following rates with the exception of berths are for round trip railroad fare.

From	Pullman all the way	Pullman to Chicago or St. Louis then Tourist Pullman (First-Intermediate	Coach to Chicago or St. Louis then Tourist Pullman	Coach all the way	Pullman Lower*
New York	139.75Y	123.45	101.85	93.20X	7.65A
Phila.	135.50Y	119.20	99.15	90.65X	7.10A
Baltimore) Washington)	132.20	116.70	98.20	89.70	6.30A
Cincinnati	105.45	98.95	82.80	74.30	1.05A-D
Cleveland	110.00	93.70	87.70	78.70	2.65B
Atlanta	106.70	91.20	83.10	74.60	4.75A
Buffalo	120.65	104.35	95.10	86.10	3.95B
Boston	145.65Y	129.35	105.85	97.20X	7.10B
Detroit	106.75	90.45	85.40	76.40	2.65B
Memphis	89.25	73.30		64.40	2.65A

	1st Class	Tourist	Coaches	1st Class Lower*	Tourist* Lower
Chicago	90.30	74.00	65.00	16.55	8.95
St. Louis	85.60	70.10	61.60	15.75	8.95
Kansas City	75.60	61.95	54.40	13.95	7.35
Omaha	75.60	61.95	54.40	13.95	7.35
N. Orleans	89.25	73.30	64.40	14.70	7.35
Minneapolis	90.30	74.00	65.00	16.55	7.35C

All tickets good three months except coach, which is 6 months.

(X)—Grand Circle ticket good two months. Costs $90.00.
(Y)—Grand Circle ticket good two months. Costs $135.00.
(A)—To St. Louis.
(B)—To Chicago.
(C)—Berth from Omaha only.
(D)—Seat Fare.
(*)—Pullman berth may be occupied by two persons at no additional charge.

sibly one which will give some idea how such plan could be worked out for other cities. Let us take Atlanta, Ga.:

1 round trip First-Intermediate rail ticket Atlanta to California	$ 91.20
1 round trip Standard lower berth, Atlanta to St. Louis	9.50
1 round trip tourist lower berth, St. Louis to San Francisco	17.90
Total	$118.60
Travel Credit Plan charge	9.49
Total	$128.09
Payable in 12 installments (monthly):	
11 payments at $10.67	$117.37
12th and final payment	10.72

Inquire from your own local railroad agent what the cost would be from your city and then you will see how simple it is to plan for the trip.

(c) Maurice Oser of Denver, Colo., has very kindly and generously invited us to a true Rocky Mountain breakfast during the stop-over at Denver. Plans for this cannot be made until we know how many are going with our group on the "Exposition Flyer."

If you intend to travel via "Exposition Flyer" you are urged to send your reservation promptly to Martin Meyer to address above noted.

Another good reason for attending the N.P.C.A.-San Francisco convention:

California Academy of Sciences
Founded in 1853
Golden Gate Park
San Francisco

August 11, 1941.

Mr. H. J. Davies, Chairman
Publicity Committee
National Pest Control Association
3934 Geary Boulevard
San Francisco, California

Dear Mr. Davies:

I am very much interested to learn that a meeting of the National Pest Control Association is to be held in San Francisco on October 27, 28 and 29, 1941.

On behalf of the California Academy of Sciences, I have the pleasure to invite the members of your Association to visit this Museum at their convenience, and either individually or as a group. If the members of the Association will make themselves known, we shall be glad to give them a personal welcome and to explain some of the work we are carrying on here. I think that they will be particularly interested in visiting our Department of Entomology.

Very cordially yours,

Robert C. Miller,
Director.

RCM:EL

We are sure PCOs will find it worthwhile to avail themselves of Mr. Miller's kind invitation.

Preliminary Information Form

Ninth Annual Convention
San Francisco, Calif. - Oct. 27-28-29

In filling in the following form, it should not be construed as binding but rather it is to be viewed as an advance barometer to aid in preparations that have to be made. Please fill out and send to the secretary's office at 3019 Ft. Hamilton Parkway, Brooklyn, N. Y.

Name .....

Total Number in Your Party.....

Address .....

City .....

1—Indicate (X) the probabilities:
(A)—I plan to attend .....
(B)—Impossible to attend .....
(C)—Undecided, but am hoping to attend .....

2—If planning to attend or possibility of attending, are you considering travelling with the party on the special train, "The Exposition Flyer"? .....

3—Are you planning to motor or go via other kind of travel? .....

4—If you have in mind any special points of interest as to sightseeing via return trip, give us preferences so that information can be procured. .....
.....
.....

5—Regardless of whether you are planning to attend, what subject matter would you like to have discussed at the Convention? .....
.....
.....
.....

(Every member please fill out and send this form to 3019 Ft. Hamilton Parkway, Brooklyn, N. Y.)

Post Convention Activities

A special invitation is extended to all PCOs to visit a mecca of scenic wonders and movieland—

HOLLYWOOD and LOS ANGELES, California

After Convention Headquarters Roosevelt Hotel, Hollywood

PCOs and their friends registering at Roosevelt Hotel, Hollywood, October 31 and November 1 and 2, 1941, will be provided with Radio Broadcasting Program tickets, and taken on free automobile tours through movieland—guests of the Southern California PCOs.

"A 'Ladybug' night in Hollywood," Saturday, November 1, 1941, is now being arranged for all visiting PCOs. (Details, time and place will be announced at the convention.)

Southern California Entertainment Committee

Mr. J. M. Miller, 1621 North LaBrea Ave., Hollywood, Calif.

Mr. William Hogan, 150 East Glenarms Ave., Pasadena, Calif.

Mr. A. A. Beliveau, 108 West Main St., Alhambra, Calif.

Note: The committee will be glad to arrange traveling itineraries, schedule special private trips, and furnish scenic information for PCOs coming to Southern California.

Ants Winning Survival Race

MINNEAPOLIS. — In a neck-and-neck race for survival man is lagging behind the ant, according to Prof. William T. Heron, a University of Minnesota psychologist.

"It seems to me that, up to now, the small-brained insects have been winning the race," he said.

The reason for this, he explained, is that man-made civilization has gone in cycles while ants and similar insects—flies, social beetles and bees—have continued steadily for 15,000,000 years.

Their survival is due, Heron said, to control of reproduction and strict division of labor, "more organized than man's in some instances." Man's civilization, however, developed because man's brain enables him to adapt himself to new situations, while ants' instinct is sufficient only to meet all situations in the same manner.—*N. Y. Evening Post.*

"Control your passion, or it will control you."

The Romance of San Francisco

"There's one thing about San Francisco. 'Tis hard to leave," said Rudyard Kipling, famous English writer. Mark Twain and Robert Louis Stevenson, two other literary gentlemen who delighted the world with their magical mating of words, both found a haven in San Francisco and agreed with Mr. Kipling, as will you, that the city has that certain something called charm. James M. Barrie, the Scotch novelist and playwright, though not a visitor to the bay city, said that "Charm is the bloom on a woman." Charm, too, may be the bloom on a city.

Charm That Is Variable

San Francisco's charm, like that of many a lovely lady, is variable—Old-World at the same time that it is ultra-modern . . . dinky cable cars mounting the straight steep inclines that are San Francisco's streets, up, up and up go the tiny cars, chauffeured by a corps of witty gripmen who take life and the hills in their stride, all the while merrily clanging their trolley bells . . . the flower stands at every street corner, a glorious clamor of color and fragrance . . . San Francisco's foreign air—Chinatown, its pagodas, carved temples, gilded doors, scarlet and indigo roofs and Oriental bazaars forming the largest Chinese city outside of the Orient . . . Fisherman's Wharf, with its cluster of pale boats riding at anchor while swarthy-skinned fishermen sit calmly mending their great brown nets preliminary to an early morning haul, and the little shops that line the wharf prepare for the day's business, steaming crabs and other sea food in great sidewalk cauldrons for visitors who await the tasty dishes . . . San Francisco's pride in her romantic and colorful past . . . Sutor's old-fashioned gardens of the eighties overlooking the ocean, replete with quaint statuary in close communion with strange tropical trees, shrubbery and flowers . . . San Francisco's surprising vistas — her fascinating little alleys housing gay shops—the fountains, flower gardens and tree-bordered walks of Civic Center with hundreds of pigeons and sea gulls bathing in the fountains and greedily pushing each other out of reach of the proffered peanuts of admiring visitors . . . San Francisco's matchless views of shimmering waters of the bay and the oft-time turbulent Pacific, ships from the Seven Seas slipping by and out to the Orient or dropping anchor at the Embarcadero to unload passengers and cargoes from other countries.

San Francisco's skyline hides its vast areas of pure vacationland from the eyes of the visitor. Nowhere in the world can the sportsman or sportswoman enjoy as many of his or her favorite sports as in San Francisco. You can fish—fly casting, bass fishing, open seat fishing, surf casting. You can play tennis. You can ride horseback, or hike, or mountain climb. You can golf. You can go bicycling. You can swim. You can sail. You can cruise. You can bowl on the Green. You can go to the races. **And,** you can enjoy any and all of these

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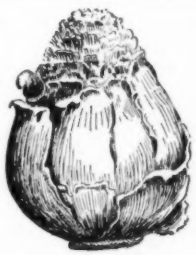

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Market Street

A slice of life from every street in the universe, that's Market Street, blanked by the Ferry Building at one end and Twin Peaks at the other. You feel an exhilarated pulse of excitement the moment you enter the Ferry Building. The symphonic purr of voices, the seemingly mad yet consistent confusion of people coming, people going. Movement, change, music from radio or mechanical box mingling with the calls of vendors whose mixed accents sound like a medley of foreign tongues, the holiday atmosphere that pervades the very air day and night plus the smell of the sea.

On the second floor you will find an interesting relief map of California which is a delight to young and old, so easy is it to interpret. The Ferry Building with its four-faced clock in the tower, has been an historic landmark precious to all San Franciscans since the early days. The present building dates from 1898. The first building was erected by the Central-Pacific Railroad in 1877. It had just three ferry slips.

The "SLOT" of the City

Extending west from the Ferry Building, Market Street, the **"Slots,"** meets your mood no matter what it be. The carnival spirit is in full sway throughout the year. "Ballyhoo Boulevard" — the clang of street cars drowning out the rasp of radio or barkers who will decree your future while you wait in one of the numerous hole-in-the-wall shops with sides and back but no door. Open to the world their salesmen entreat you to buy a silk necktie for a quarter, will even show you how to tie it the "Esquire" way. Sparkling jewels for as little as four bits, the newest kitchen gadget, calling cards printed as you watch, with an eagle resting just above your name. A young lady mends silk hose: "It's as easy as two and two" she chants in a singsong tone, "Over, under," then in an undertone: "Scram" to a small lad playing tag under her counter. Never lifting her eyes she continues her mending as the crowd chiefly men, watch.

Flower corsages are sold in a two-shelf hole shop by a handsome, tall, immaculately dressed black-eyed Italian youth. Behind a circular hole, a dusky-haired maiden with two gardenias nestling above each ear, serves Hawaiian soft drinks in a setting hung with artificial leis and palms.

Tricks and Then Some

If you've a yen to play tricks on all your friends, the "Joke and Trick" shops will show you a hundred new ones. The Chowder Bars, the bar almost at the sidewalk's edge with not more than half a dozen seats. Steaming bowls of delicious clam chowder are served to you by jovial, hearty-voiced Italianos, great baskets of clams and oysters reposing at the end of the bar next to generous dishes of tiny ball oyster crackers. 15 cents for chowder or cocktail.

The Markets. Windows, gems of artistic endeavor—thick red steaks, chops, sides of beef arranged in geometric array, trimmed with greens, bordered by rows of slices of deep coral salmon, tuna and other fish, poultry at either end for mainstay and the entire display flanked always outside the windows with flowers of every hue.

Luggage shops, selling everything from a twenty-five cent key holder to a complete ensemble of beautifully matched pieces. Hamburger and sandwich holes no wider than a table. Snail Shops — "Snail and Coffee, 10 Cents"—deceiving sign if you're thinking of a certain kind of a snail. The Five-and-Dime emporiums vieing for favor with the Drug Stores displaying everything but overcoats which are passe in San Francisco, anyway.

Likely as not, you'll see merchandise displays on Market Street that you'll find nowhere else in the world, as a pair of trousers and shirt on a headless mannequin, an umbrella with a crook handle stuck in center of the neck where the head should be.

Market Street also houses several well known department stores. Shoe Shops, Men's Sports Apparel and Sports Equipment Stores that invariably display a 60 to 100 pound bass on the sidewalk mounted on a great slab of ice. Movie Theatres, gilded and perfumed and imposing; honky-tonk amusement places; pet shops that always draw an audience; Music Stores; Cutlery Shops with knives of every type and nationality; Health Food Stores.

Tatooing! To Be Sure!

And, if you feel a trip to San Francisco is a total loss unless you have a little tatooing done that, too, is yours for a small fee in the "Penny Arcade," where you also can find the picture of your future mate for one cent, have your photograph taken while you wait, tinted too or, make a record of your own voice.

The Nougat Men

Market Street would not be complete without mention of the "French Nougat" men who appear from nowhere when night falls. There they are, the "A. B. T. French Nougat" painted on the front of their tiny white booths with white robed clerks who divulge the information that their booths are on wheels and they can't afford to rent a shop so wheel the little booths into the spaces between doorways, Sunday and evenings selling their 5, 10, 15 cent bags of French Nougat, made in San Francisco. They've been doing it this way for over 20 years.

Historic Market Street

Market Street has its historic moods as well. Notice the light standards with their exquisite sculptured relief figures of covered wagon trains and Indians, women, children, animals representing the founding of the West. They are the work of the famous San Francisco sculptor, Arthur Putnam. You can see a complete room of his work at the Palace of Legion of Honor Art Gallery.

Lott's Fountain

Another interesting memento of early San Francisco is Lott's Fountain at Third and Market. The intimacy of the inscription: "To the citizens of San Francisco from LOTTA—1875. Lotta Crabtree was the singer whose songs were greeted by the shower of glittering gold nuggets flung at her feet by enthusiastic miners during the lusty gold rush days.

At the intersection of Turk and Market Streets is the Phelan Fountain and Native Sons monument with its gripping inscription:

"The Unity of our Empire hangs on the decision of this Day."
W. H. Seward
On Admission of California
U. S. Senate, 1850

One block down you'll see one of the tallest clocks in existence, with all its works in full view, encased in glass. It has been a landmark on

Market Street for 25 years. It is insured by Lloyds of London, the Samuels Albert Company, jewelers, who placed the clock at the curbing in 1914.

And down near the Ferry Building at Battery Street and Market you see the powerful monument: "Dedicated to Mechanics." As you stand there look down at your feet and know you are standing on one of the original landmarks of San Francisco. Imprinted in the sidewalk is this inscription:

> "This tablet marks the Shore line of San Francisco Bay at the time of the discovery of gold in California, January 24, 1848. The map reproduced above delineates the old shore line."

Gardenias for a Nickel! Violets the Same!

"Who will buy my Vi'lets" could not ever be a popular song in San Francisco. Or gardenias or roses or carnations or asters or daffodils or tulips or delicate heather or-or- we could mention every flower that grows. They one and all bloom on the hundreds of flower stands that are gay splotches of color under bright awnings on downtown street corners of San Francisco. With vi'lets but a nickel a bunch, gardenias the same, it's fun to imagine what a fair lady would do with a dollars worth, the price she'd have to pay for one bunch of lovely purple flowers in other cities. In her home city, she'd wait, no doubt until some gentleman went chivalrous and bought them for her.

Not in San Francisco! Every last woman wears flowers some time during the week, often every single day. It's no surprise whatever, to be greeted by sales clerks—the baker, the butchers, even the candle stick maker, wearing fresh flower bouquets. One radio wit announced recently that the family cat refused to stir outside for his evening stroll unless adorned with a flower bouquet tied to his collar.

This is just by way of saying that when you come to SanFrancisco you, too, will wear a gay bloom in your coat lapel if you're a man and on your frock, suit or gown if you're a woman. The men folks will buy fresh flowers for their ladies and the ladies will buy them for themselves. Flowers are so inexpensive and so gala and so downright beautiful and fragrant. All the flowers are grown in the bay area and delivered in great trucks to the street stands early each morning.

No city in the United States can boast of such a gay, romantic custom as can San Francisco with its downtown flower stands. No story of San Francisco's flower stands should be told without speaking about the gallantry of the flower stand salesmen, nearly all Italians who own their own stands, and gentlemen, one and all. With a dash, a verve, a manner all their own, they pin on the bouquets on any fair lady's shoulder with an intent and artistry that is something else to remember of the City by the Golden Gate.

Ants in His Pants Cost Him $50

SCHENECTADY. — A 57-year-old man, brought into court for "swearing so loud it disturbed the whole neighborhood," pleaded guilty to a disorderly conduct charge and was fined $50 by Police Justice Charles Fryer.

"What did you swear so loudly for?" demanded Judge Fryer.

"I was working in the garden," said the defendant, "and I got ants in my pants."—*N. Y. World Telegram.*

"When angry, count ten; when very angry, a hundred."

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Roach Control in the Mill

By WILLIAM J. HAUDE, *Entomologist, John Powell & Co., New York, N. Y.*

EDITOR'S NOTE: *We reprint the following article which appeared in the April, 1941, issue of the* "AMERICAN MILLER".

FEW insect pests are so generally distributed throughout the world and at the same time so universally loathed as the roaches. Their ability to thrive on practically all types of cereals as well as dead vegetable and animal matter, make them common pests in practically all mills, warehouses, and other places where food products are handled. Aside from the foodstuffs they destroy, their slinking nocturnal habits and pronounced odor when present in large numbers make them an extremely disagreeable pest.

In most mills the damage done by roaches is not limited to the food they consume, but in the tainting of everything with which they come in contact. They leave, whenever they occur in numbers, an offensive sickening odor, generally referred to as a "roachy odor." This odor comes chiefly from the dark colored fluid which exudes from the mouth of the roach, and is used by the insect to stain its runways. Also, the scent glands which occur in both sexes discharge an oily volatile liquid possessing a very disagreeable odor.

Ancient Lineage

Roaches are among the earliest insect inhabitants of the earth, appearing way back in the Silurian Age when the prevailing temperature was warm and the atmosphere was full of moisture; conditions which today are favorable for the development of roach infestations. So prevalent were they at this time, that entomologically speaking, it might be termed "The Age of Roaches."

Although the fossil remains of roaches of that period must be measured in units of feet rather than inches, their form and general characteristics have changed but little. As a group, their natural home seems to be in the Tropics, for it is in these regions that the greatest wealth of species and greatest number of individuals are found.

Roaches were very early associated with man in his primitive dwellings and with the rise of commerce were distributed to all quarters of the globe. On shipboard, they have always been especially numerous and troublesome; the moisture and heat of the vessels being very favorable to their development.

Common Species

The common Oriental Cockroach or so-called "black beetle" is of Asiatic origin and was carried to England and Holland during the 16th century in the ships that brought tea, spices, and perfumes from the east. From there, it found its ways to the Americas with the early settlers. The original home of the common German roach, however, is obscure. Undoubtedly, they have been associated with man from earliest times, flourishing in the older civilizations of Asia and Egypt. Of the two other roaches commonly found in this country, the Australian roach, as the name implies, is a native of Australia, while the American roach is a native of tropical and subtropical America.

Rarely are two species of roaches found infesting the same place. The different species are antagonistic and will prey upon one another until one species gains dominance.

Of the four common species of roaches found in cereal plants in the United States, the most prevalent is the German roach. This is a small species measuring about 5/8 in. long when mature. It is light brown in color and bears two distinct dark brown longitudinal stripes on the thorax. Usually, it is active and prevalent throughout the year particularly if the building is well heated.

Cause of Spread

The spread and increase in importance of this species as a major insect pest is correlated with the installation of water distribution systems which took place in many American cities during the last century. In fact, this roach is commonly referred to as the "water bug." While it is quite evident that the German roach was present in this country long before the installation of modern water systems, piping afforded it means of entrance into residences and greatly encouraged its spread and facilitated its increase in numbers. The dampness of sweating water or steam pipes affords very favorable conditions for the German roach and usually the heart of any infestation will be found in close proximity to water or steam pipes, particularly if they are enclosed in the wall or roughly covered with insulation material.

The German roach is much more active and wary than the other larger species and multiplies much more rapidly. For this reason, it is much more difficult to keep under control.

The American roach is the native species of this continent, originating in tropical or subtropical America. It measures about 1½ to 2 in. in length, is light brown in color and possesses strong, well developed wings in both sexes. This roach is well distributed throughout the United States. Under normal conditions there is one generation per year although they will breed the year around under favorable circumstances.

The Australian roach resembles the American roach very closely, but it is seldom more than 1¼ in. long and is easily identified by a bright yellow heavy line on the outer edge of the wings. This roach does not seem capable of establishing itself in the north, as isolated infestations occur which die out in a short time. It occurs in the south, however, in great numbers.

Oriental Roach

The Oriental Roach is about an inch long, the males being dark brown in color while the females are nearly black. This species is easily distinguished from the others by their poorly developed wings. The wings of the male extend about two-thirds the length of the abdomen, while the females have no under wings and the wing covers are less than one-fourth of an inch long. This roach, or the "Black Beetle," as it is sometimes called, is widely distributed throughout the country. It is notably gregarious in its habits, the small roaches will usually be found running over and sitting on the large ones with no resentment being shown.

The Oriental Roach was prevalent in the early colonies of the Americas and was commonly known at that time as the "Mill Beetle," because of the many mills which were infested with them. The early Dutch called them "Kakerlach" and in the Swedish settlements they were known as "Brodoetare" (bread eaters).

The roach in its various stages of development from egg to adult shows little variation in either its appearance or habits. The eggs, instead of being laid separately, as in the case with most insects, are brought together within the abdomen of the female into a hard capsule or egg case. When filled with eggs, this capsule usually projects from the abdomen and may be held in this position for weeks, until the young are ready to emerge. When the young nymph is ready to break forth from this egg case they are sometimes assisted to escape by the parent, who with her feet aids in splitting the capsule. On hatching, the young are often brooded together by the parent for the first few weeks.

The young nymphs develop through a number of molts; usually five to seven; the skin splitting along the back and the insects coming out white and soft, but rapidly hardening and assuming the normal color. The wings developing to full length at the time of the last molt.

The length of life of the average roach is open to some question, two or three years, however, is not uncommon. The German roach will reach maturity by four to six months, while approximately a year is required for the other species. This rate, of course, depends largely on food and temperature conditions.

As contrasted to other mill insects an abundance of roaches is not therefore due to their rapidity of multiplication as much as their ability to resist or escape improper control measures.

Habitats

In mills and food storage plants, roaches are liable to be found at any place where they can obtain cover, but usually they will become most abundant around steam pipes, radiators, or near a boiler room where temperatures are maintained above normal. Their thin flat bodies enable them to squeeze themselves into cracks or spaces where their presence would not be suspected. This ability to conceal themselves so well during the day when they are inactive usually results in a large population building up before control measures are taken. Usually, if a few roaches are seen scurrying around a lighted room during the day, there will be literally thousands of them out searching for food during the night.

Roach Control

The food habits of the roach are extremely cosmopolitan. They will feed on all types of cereal products as well as dead vegetable and animal matter. If food is scarce they will even eat their cast skins and egg cases and reportedly their own kind. It is evident therefore that a mill af-

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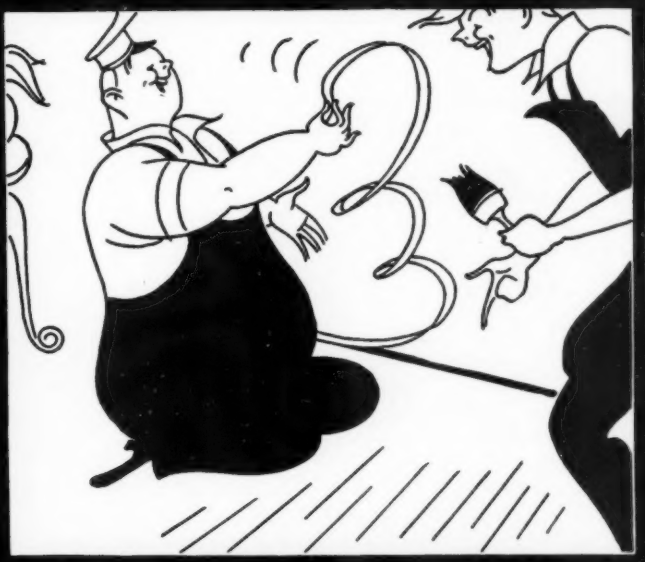

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fords ideal conditions for their development insofar as food is concerned.

Introduction of roaches into a plant may occur in any number of ways, the most common being in the return of used bags or returned shipments from an infested establishment. This is by no means the only method, however, as they may be brought in with lunch boxes, bag shipments, or in some cases actual migration from near-by buildings may take place.

Roaches are well endowed with the ability to take care of themselves and like the rat, long association with man has made them immune to crude methods of control. Many types of control measures are recommended, only a few of which are practical for use in a mill. Roughly, these measures may be classified as (1) use of insecticidal sprays and dusts, (2) fumigants, (3) trapping and (4) the use of baits.

Insecticidal dusts are most commonly recommended for the control of roaches. These so-called "roach powders" usually consist of either sodium fluoride, sodium silicofluoride, pyrethrum powder, borax or a mixture of these materials.

Sodium Fluoride

Sodium fluoride is one of the most effective insecticides for use against roaches, but because of its highly poisonous nature its use is not recommended in any place where it would be liable to contaminate foodstuffs. In its natural state, it is very similar in appearance and color to flour, a similarity which has resulted in many accidental deaths throughout the country.

Some states and municipalities now require that sodium fluoride be colored green when it is sold for insecticidal purposes to avoid the danger of misuse. Sodium fluoride acts on cockroaches both as a stomach poison and as a contact poison and in order to be effective it must be dusted thoroughly in all cracks and crevices where roaches abound. As a roach toxic, it has a comparatively long residual action.

When roaches run through sodium fluoride, powder sticks to their legs and often the antenna. Some of the powder is moistened or dissolved in the exudation about the bases of the legs and on the thinner portion of the outer integument. This seems to cause some irritation and uneasiness; the insect soon begins to clean the moistened powder from the body by licking it. In doing this, enough of the poison may be brought into the mouth and swallowed to kill in a period ranging from four or five hours to ten days. In order to speed this action, irritants such as pyrethrum powder are added to the mixture, thereby resulting in more rapid results and kill.

Sodium fluoride has the advantage of being relatively cheap, as large quantities of it are used in the manufacture of kitchen enamelware and for other purposes.

Sodium silico fluoride is similar to sodium fluoride in its action against roaches, but is not as effective. It is sometimes used because of its lower cost, however, cannot be recommended because as is the case with sodium fluoride, it is quite poisonous and other safer means of control are available.

Fluorine Compounds

Recently, fluorine compounds have been the subject of much discussion and research work particularly in the middle western parts of the United States, because of the proneness of this element to produce a condition known as "mottled teeth" in human beings. This condition is believed to be due to an upsetting of the calcium balance in the system. The effects vary, in cattle a softening of the teeth becomes evident when it is present in drinking water in doses as low as 25 parts per million. In humans, it is usually marked by an extreme brittleness of the teeth as well as a mottling effect which is very unattractive.

Borax or technical sodium borate is occasionally used as a roach insecticide, but this use has been generally replaced by sodium fluoride, because of the more rapid action and greater effectiveness of the latter compound. Its action against roaches is similar to that of the fluorine compounds, but it is doubtful whether a heavy infestation of roaches could be satisfactorily controlled through the use of borax alone. Then, too, its similarity in appearance to flour would require great care in its use in granaries and flour mills, in spite of its lower toxicity to human beings.

Pyrethrum Powder

Among the powdered insecticides for roaches, the safest and perhaps the most effective from the standpoint of mill sanitation is pyrethrum powder. This material is purely of plant origin, consisting of the pulverized heads of the pyrethrum daisy. Pyrethrum powder is quick in its action, very toxic to roaches when they can be dusted directly with the powder, and at the same time is nonpoisonous to human beings should it be inadvertently mixed with foodstuffs in a mill. Its principal disadvantage is that it loses its toxicity quickly and applications must be made frequently in order to obtain good control of the roaches.

Pyrethrum flowers, which are grown commercially in Africa, Japan and South America contain a small percentage, i.e., .5 to 1.3%, of an extremely toxic insecticidal compound known as "pyrethrins." These pyrethrins are strictly contact insecticides and in order to kill, they must come in contact with the insect's body. To accomplish this, it is generally advisable to apply the powder into all cracks and crevices where roaches may abound with as much force as possible. This is best done with a good dust gun, preferably a power machine which propels it with considerable force.

The topic action of pyrethrum powder, or rather the "pyrethrins," is restricted entirely to cold blooded animals such as insects. The powder on contact with the insect's integument is taken partially into solution or suspension and causes a progressive breakdown or lysis of the peripheral nerve endings. The first reaction on the part of the roach is one of great irritation and they will be seen running from their hiding places in a state of great excitement. After a relatively few minutes partial paralysis will result and generally they will turn over on their backs to die or succumb to the depredation of other insects.

In order to gain effective control of roaches through the use of pyrethrum powder, the application should be repeated a number of times at intervals of two or three weeks. This is necessary, because some individuals will be missed at the time of the first application and further, in an established infestation a great many egg cases are left in obscure places which will produce a new brood.

Specifications

To insure maximum effectiveness, pyrethrum powder should contain a minimum of .5% pyrethrins and should be fresh, insofar as is possible. Pyrethrum is susceptible to deterioration in the presence of moisture, heat or if exposed to air and light. For this reason, it should be purchased from a reputable supplier and stored in a cool, dry place if not used immediately.

Mill Sprays

From the standpoint of economy as well as availability, perhaps the best all around roach control product available to the miller is a good mill spray.

(Continued on Page 26)

Chloropids Swarming in Houses

By CURTIS W. SABROSKY, *Michigan State College, Department of Entomology*

THE occurence in extraordinary numbers in houses of tiny Dipterous insects of the family Chloropidae has been recorded many times by European authors, especially in Germany and England. The vast swarms (Massenauftreten or Massenvorkommen) are recorded as covering the ceilings and windows, and at times making it impossible to use certain rooms. Hase (1929), recording the collection of 35 to 40 liters of flies in one of the outbreaks, calculated that there were 12 to 14 million individuals concerned, there being about 360 flies per cubic centimeter. Estimates in other instances have been as high as 30 million individuals.

All records in the literature are of species of *Chlorops* or *Chloropisca*, and about half refer to the common Palaearctic species, *Chloropisca notata* Meigen (=*circumdata* Meigen). Because of confusion in identifying species in these genera, many of the older records of other species may really be referable to *C. notata*.

Such mass occurrences of these very small flies have not hitherto been recorded in the Americas. It is of interest therefore to record such an occurrence at a resort hotel in Charlevoix, Michigan, in June, 1940. The writer was asked to determine "insects found around the window casings in our hotel here in Charlevoix. They appear in great numbers and occasionally come out and fly around. . . . They seem to be getting worse every year, though we cannot find any damage they have done." The large number of specimens submitted proved to be *Chloropisca annulata* (Walker) (=*C. variceps* Loew), a species which is the closest relative of the European *C. notata*. To the writer's knowledge, this is the first recorded instance in America of chloropids swarming in houses as is often observed in Europe.

No conclusion has ever been reached on the reason for the sudden occurrence of such vast numbers of individuals. The most frequently advanced suggestion is that, like the cluster fly, they are seeking quarters for hibernation, since the majority of swarms have been observed in the fall of the year. Swarming for the purpose of mating or oviposition has also been suggested, and emergence en masse from their puparia may also be a possibility. No damage other than considerable annoyance has resulted from these swarms, which can be readily disposed of with pyrethrum fly sprays or dusts.—7-31-40.

LITERATURE CITED

Hase, A. 1929. Weitere Falle von Massenauftreten der Fliege *Chloropisca notata flavifrons*. . . . Anz. f. Schadlingskunde, 5: 159-160.

A queen ant may live to the old age of 15 years says an entomologist who knows of such a case.

—*Science News Letter.*

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Insecticide Coloration

Economic Poisons, the Prevention of Their Misuse . . . By Distinctive Coloration and Other Warnings

By DR. ALVIN J. COX, *Chief, Bureau of Chemistry, Calif. Dept. of Agriculture*

EDITOR'S NOTE: *Reprinted from* SOAP AND SANITARY CHEMICALS, *June, 1941.*

THE subject of protective coloration of economic poisons is one which is getting increasing attention both from insecticide manufacturers and officials in charge of regulatory work. "Economic Poisons" is merely a term. It is defined in the Agricultural Code of California as "any substance, or mixture of substances intended to be used for preventing, destroying, repelling, or mitigating any and all insects, fungi, bacteria, weeds, rodents, predatory animals or any other form of plant or animal life which is . . . a pest, which may infest or be detrimental to vegetation, man, animals or households, or be present in any enviroment whatsoever." Intended use rather than character of a material finally determines whether or not it is an economic poison. From the standpoint of poisonousness, any warning should be considered in rélation to all uses of a material and not be restricted to ecnomic poisons. This discussion refers to those substances sufficiently poisonous to require an official poison label, whether or not they are used as economic poisons.

Readers of this publication will recall that it has repeatedly emphasized that insecticide manufacturers may soon face a dilemna unless they take prompt action with regard to warning coloration. If manufacturers by agreement among themselves and by cooperation with enforcement agencies will arrive at a system of coloration satisfactory to all concerned they may thereby largely forestall a handicap of improper legislation, and avoid a multiplicity of restrictive legislation by states, cities, and counties, requiring coloration of poisonous substances. It would be an impossible situation if a manufacturer were required to color a roach powder with a half dozen or more colors to suit many variable independent requirements.

A proper label is the best, and generally adequate, protection of the public with regard to the manufacturer's packages of poison. However, labels may become illegible, detached, or handled by the illiterate, and also there is the problem of safeguarding against unlabeled material which has been removed or transferred from the original package. In the case of fumigants, merely a caution regarding the material in its original package does not safeguard against it after being released.

Great progress has been made in the truthfulness of label statements, both as to positive as well as restrictive aspects. Manufacturers generally have cooperated with officials. The label on a product, even more than advertising literature, is the manufacturer's best contact with the user. Some firms have illogically omitted information necessary to the public rather than discuss it with officials and get it into satisfactory form. The presence of adequate directions for use in all conditions, which should include dilution, method, time, dosage, frequency, and duration of application, are all safeguards against misuse of a material. Proper labels now bear, when applicable, precautions such as:

Do not store near foodstuffs.
Do not spray near open flame.
Keep package away from children.
Apply to plants only in the dormant season.
Do not apply to the following plants (or animals):
Do not administer to weak or unthrifty animals.
Do not apply within six weeks of harvest.
This product is not compatible with the following:
Should not be applied in hot weather.

In some cases a label may be inadequate, and it is negligence to permit a hazard which it is possible to avoid by proper precautions. With the constantly increasing use of dangerous economic poisons, a manufacturer should employ every reasonable auxiliary means available for protecting the public from confusing them with food. A dangerously poisonous material insofar as possible should carry its own warning. A warning may be inherent in the product, or it may be added. The four senses at our command for this purpose, in order of their importance, are sight, smell, taste, and touch.

Coloration for those who are not color-blind may be an excellent supplement of labeling of poisons so that they will appear different from food. The important consideration in coloring a product is to make obvious that it is not a food or beverage, and is not necessarily to obtain standardization or uniformity of color on specific poisons as a means of differentiation. Red tags, the red vignette representing the skull and crossbones, have already aroused warning consciousness with respect to economic poisons.

A trace of a repulsive, pungent odor, such as pyridine, in some cases might serve a useful purpose to warn the public of a poison. This may be the only means of protectively warning of the presence of released fumigation gases. This system has been employed to warn against odorless natural gas used by some municipalities.* Since, in general, labeling is properly done, it might be more effective further to depend on the sense of smell and identify an economic poison with a trace of objectionable odor, than multiply dependence on the sense of sight by adding coloration.

Tasting as a method of detecting poisons is not safe for inexperienced persons, but technical men frequently use this as a means of identification; for example, a strychnine grain has a distinct bitter taste. However, an added disagreeable taste might be some protection by preventing a person or domestic animal from eating or drinking enough to be harmful.

The type of container has a bearing on protection. Sale of poisoned bait in a bottle cap or in a container open at both ends has been declared, in California, to be contrary to the best interests of public health and safety. Also we have refused to permit arsenical ant jelly to be marketed in collapsible tubes which might be confused with those commonly used, for

*Odors have been used to mislead the public; for example, to give a shingle stain the odor of creosote without adding enough to impart a preservative effect.

food products, for tooth paste, and for other household articles. We hope to get the collapsible tubes that are still in use for any economic poison replaced by safer containers. Several years ago action was taken in California to require the poison label to be placed at the top of any collapsible tube already in use for economic poisons. Previously, in some cases, the poison insignia had been near the bottom where it was covered with the first few rolls of the tube. From time to time other types of unsatisfactory containers have been improved in design to the point where they are acceptable. It has been suggested that the public be educated to associate a triangular, prickled, ridged bottle, or other type of protective package with household poisons.

At the twenty-fifth annual meeting of the National Association of Insecticide and Disinfectant Manufacturers, Inc., held in Washington, D. C., December, 1939, and reaffirmed by the Association a year later, there was unanimously approved, with regard to Nile blue sodium fluoride, as the officially designated product of the Association, a resolution as follows:

BE IT RESOLVED THAT The National Association of Insecticide & Disinfectant Manufacturers, Inc., recommend to its members, and to all other manufacturers of household insecticides containing sodium fluoride, that only sodium fluoride of a nile blue color be used,

AND THAT such product shall be considered the standard sodium fluoride of this Association.

Bulletin No. 25, February 11, 1941, of the Association reports federal specifications for sodium fluoride O-S-601, August 19, 1930, as amended October 24, 1938, which provides that "sodium fluoride for use as an insecticide shall be colored nile blue. While this does not have the effect of law and is not mandatory with the industry, it is mandatory on all government departments in the purchase of sodium fluoride for use as an insecticide."

There is some uncertainty in the information available regarding the coloring of fluoride compounds, the color depending upon whether the material is for agricultural or household use. Such a distinction as this seems unnecessarily confusing unless it were made between (1) sodium fluoride and its mixtures commonly used in households but not on plants, and (2) other fluorine compounds such as cryolite, barium fluosilicate, and sodium fluosilicate, commonly used on plants.

Under Section 1072 of the Agricultural Code of California, "the director may, after hearing, cancel the registration of, or refuse to register, any economic poison . . . which is detrimental . . . to the public health and safety when properly used." This is believed sufficiently broad to require compulsory coloring of economic poisons should the director deem it advisable. In California insecticide manufacturers voluntarily have distinctively colored powdered fluorine and arsenic compounds, as a precautionary measure, and the result appears satisfactory. The color selected for sodium fluoride is nile blue and that for lead arsenates and calcium arsenate is pink. Distinction between heavy calcium arsenate to be used for airplane work and regular calcium arsenate is made by adequate and prominent labeling rather than by another color. Sodium arsenite solutions used for wood-preservation, and the control of termites and of weeds, have been mistakenly used, and caused serious poisonings. In California we are seeking a cheap and suitable means of coloring such materials. Some solutions are so dark-

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colored they may serve as their own warning. Sodium bichromate would be unsatisfactory as it gives an amber color similar to whiskey. To be satisfactory, a color must be sufficiently evident upon dilution. We have tests under way to determine the permanence in alkaline solutions of a number of dyes submitted by manufacturers for this purpose.

The permanency of certain colors in alkaline sodium arsenite solution containing arsenic trioxide 30 per cent has been investigated. Preliminary data indicate most of the eighteen organic dyes recommended and received from two companies were found apparently stable at a dye concentration of 40 to 100 parts per million. This concentration was sufficient still to impart a distinctive warning color after the alkaline sodium arsenite solution had been colored three months, and was then diluted ten times with water. A suitable color for sodium arsenite solution is believed readily available.

In several other states laws have been suggested to require compulsory coloration of certain economic poisons. The proposals usually provide that it is unlawful to sell any product containing poison used for control of insects, rodents, or other indoor or outdoor pests unless it is colored purple, red, blue, or green, so it may not be confused with foods. Premature legislation of this kind would add confusion. A state wishing to make regulations should see to it that they are broad enough to be reconciled with those of other states.

The best legislation probably specifies no color, but government agencies have been known to require different colors for the same product. The ideal might be to have the same color and insofar as possible a constant odor for all economic poisons. Unfortunately this could not be applied to many household products. The use of carbon black, just enough to throw the product off-white, has possibilities for coloration of economic poisons to make them unattractive as food. No doubt it would be inadvisable to color all poisons strongly black, as such a residue on plants probably would be objectionable to all concerned.

Inasmuch as some pest control materials are incorporated in decorative paints, legislation, agreement or regulation should be sufficiently flexible so that marine anti-fouling or other preservative paint containing arsenic, copper oxide or mercury compounds would not be limited as to desired color, other than by the natural color of the materials themselves. At present agitation for additional protective measures applies more to household economic poisons than to those for field use.

Before any auxiliary safeguard, such as a warning color that does not suggest an edible food, can be logically and generally applied, a great deal of investigation should be carried on. It should not be overlooked that certain colors might attract children rather than warn them. In selecting a protective color, solutions resembling whiskey, wine or other beverage should be avoided. To have a compound colored blue in one instance and green in another might be more hazardous than to fail to color it at all. The choice of color is important. To color a less poisonous substance green might make users more careless with paris green, a deadly poison, and if on vegetables the colored product might be erroneously interpreted as a copper spray residue. A trace of color or odor should be sufficient to indicate that it is not to be used as a food or beverage, and would less likely destroy the usefulness of the material for compounding other products. Certain insects are repelled by some colors, and also some colors may be unacceptable as food to definite species. On the other hand, some colors are attractive to insects. These are broad and important problems, and the effectiveness of the numerous and voluminous agricultural insecticidal and fungicidal sprays and dusts must not be impaired. The economics of the situation also is a factor. The problems can best be solved cooperatively by consultation of all concerned, rather than by haphazard unconsidered compulsion.

The Agricultural Insecticide and Fungicide Association and the Manufacturing Chemists' Association are both greatly interested in the question of coloration and other auxiliary and alternative safeguards. The wide interest even more suggests the useful purpose of coordinating the various activities in order to reduce present hazards from poisons and protect against new synthetic organic chemical compounds as they may appear on the market.

It seems very desirable for the industry to consider the general problem of the protective or warning coloration of poisonous pest control materials, rather than some restricted phase of the matter. The industry can do a great deal to clarify the problem. There are many related products which must be considered eventually and may well be included in some type of general arrangement. For example, poisoned grain for the control of injurious rodents and birds has been mistakenly fed to animals and even used for human food with disastrous results. Some manufacturers of such products in California have been coloring (green) one sack out of every twenty before mixing, so about one grain in every twenty of the finished product is prominently colored. The mixture is very distinctive. A similar treatment of poisoned brans used for the control of snails, slugs, cut-worms, grasshoppers, and similar pests has not yet been adopted. Some arsenical ant syrups have been distinctively colored. No action has been taken regarding the coloring of nicotine dusts (usually made with hydrated lime or other white diluent), mercuric chloride (used for treatment of seeds, bulbs, and tubers), tartar emetic (now finding use as a spray for the control of thrips on certain crops), disinfectants resembling water, sodium chlorate (used as an herbicide), or similar pest control materials. Such materials may or may not be included specifically in an industry agreement, but the wording of such an agreement or of state regulations should be so chosen as to avoid confusion of a particular problem with a general one.

There are many things to be decided before a definite color or colors and odor or odors should be agreed upon. These problems should be solved by the industry in advance of legislation. When this is done, instead of opposing legislation, the industry will be in position intelligently to lead to uniform laws and practices throughout the states and other government agencies. A review should be made of the causes of accidental poisoning, and the comparative hazard of economic poisons. Certain non-economic posion pharmacy items taken in undue amounts by irresponsible persons have been the cause of accidental poisoning and even death. The label or other protection is intended to warn against danger in large quantities, and should apply to like materials in like circumstances. The Bureau of Chemistry of the California Department of Agriculture will be glad to contribute any assistance in this matter that it can.

I suggest that chemical manufacturers and all others interested set up a central cooperative board with representatives from the various states or regions to determine and recommend standard colors and odors, if needed, and how to use them for protection of the public in a manner not detrimental to anyone. This work is necessary as a foundation for any good law, and should be available to forestall premature or harmful legislation.

———•———

Goldfish, says a Government entomologist, are fairly good at eating mosquito "wrigglers" if hungry, but top minnows are much better. —*Science News Letter.*

Research Program Planned

An aggressive research program with pest control operators as field men and the Conference faculty as the administrative and laboratory force is being planned by members of the Pacific Pest Control Conference Committee.

Mutual understanding of the problems of commercial pest control and research has been enhanced by the four sessions of the Pacific Pest Control Conference for both operators and faculty members. Now it is believed that major research projects can be launched. Those problems in which the laboratory research worker needs data from practical field tests, or where operators need extensive laboratory facilities and scientific direction are the ones which are expected to be solved by this program. The need for extensive research in household and structural pest control has long been felt and now it is believed that the facilities and organization are at hand for this work.

While no decisions have been announced as to the problems to be studied, some appear to be directly in line. Carpet beetles have been mentioned at almost every convention and conference as a pest about which too little is known, and against which control measures are inadequate. With a little direction the operators could obtain a great deal of information which might help with the problem.

So-called "powder post beetles" are pretty much step-children of the industry and of scientific research, it appears. However, many buildings are being weakened structurally and damage done to furniture and fixtures by their activity. The average operator has little opportunity to make comparative tests of control materials and methods and has no sound basis for determining effectiveness in many cases.

Fungus control methods would probably yield to greater standardization. Termites present endless problems which have had little concerted attention since the completion of the work of the Termite Investigations Committee in January, 1935.

Rats and mice, roaches, moths and ants have possibly had a fair share of attention from many sources. But it is doubtful if most operators can test out the relative merit of materials and methods without some outside help. Operators have little chance to check definitely on the quality of materials which they purchase. The earwing problem is increasing and merits attention.

Standard technique for preparation of tests and for raising of pests for testing purposes is also needed. Within the last few years the rearing of houseflies and development of standard tests has been fully worked out. Similar progress in connection with a large variety of pests might well be one objective in the program under consideration.

Definite objectives must be selected before any work is started but it is considered desirable to survey the whole structural pest control field before planning the program.

Operators who have specific problems which they feel merit research work or field tests or both, are requested to send the suggestion to George Rader, Chairman of the Pacific Pest Control Conference at 1219 Oxford Street, Berkeley.

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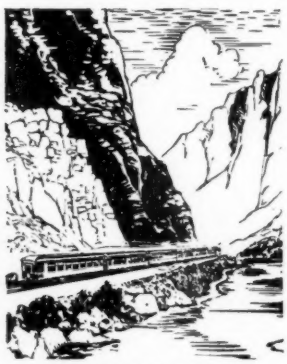

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Skunk Odor Protects Food from Rats

THE odor of skunk mixed with honey may replace rat traps and poison in the protection of feedstuffs from rodents, according to a report of two Minnesota scientists to the American Chemical Society.

Honey containing n-butyl mercaptan, the active ingredient of the odor of skunk, was placed on commercial feedstuffs in a series of experiments conducted by Leonard A. Ford of State Teachers' College, Mankato, and Donald F. Clausen of the International Milling Company, Minneapolis. The feed was untouched by rats for four months, the normal storage period for such products. Rats accustomed to eating from pans refused to touch food treated with the honey-mercaptan mixture.

When the mercaptan was placed on the food of caged white rats, the odor made the hair rise on the back of the rodents' necks, and they became nervous and excited, the scientists say. The smell seemed to precipitate fights among them, and the food was untouched until the odor disappeared. Other volatile irritant compounds, such as carbon tetracholoride and denatured alcohol, had much the same effect, but to a lesser degree.

"The protection of commercial feedstuffs from the depradations of rats and mice is both expensive and time consuming," they point out. "In place of the common methods of using poison and trapping, we have applied the principle of repellent odors for the protection of sacked commercial feedstuffs. Experiments have shown that the nose of man is extremely sensitive to certain odors. Should not certain scents likewise cause a reaction in rats and mice?"

The characteristic odors of weasels, skunks, ferrets, and minks were chosen, because these animals are the natural enemies of rats and mice, it is explained. The presence of ferrets and skunks on a farm will drive rodents away. To be effective as a rat repellent, however, the odor-producing mercaptan must be absorbed in a substance which will retain the smell for four or five months.

Honey was found to hold the odor for four months, dead mouse for two weeks, and fat scraped from a rat skin, six days. The following substances held the odor overnight: rat hide, stock concentrate, glycerol, soap, and castor oil. It was hoped that printers' ink would retain the odor, since it is used on commercial feed sacks, but the odor quickly disappeared from ink, as it did from lard, mineral oil, petroleum, and many other substances.

In the experiments with feed, honey was used, as it retained the odor of the mercaptan as long as it is commercially necessary. When the honey-mercaptan mixture was tried experimentally at a city dump, it was discovered that the mercaptan had little repellent effect after three days. This would seem to indicate, according to the scientists, that the dump rats were used to the odor the mercaptans formed in decaying organic matter. That the food supply was limited and the number of rats large also may have had a bearing on the results.

"These investigations have suggested the possibility of using mercaptans or similar substances to discourage the attacks of rodents on commercial feedstuffs," the report says. "The failure of rats to eat foods treated with mercaptans may have been due to the fact that the treated substance was not regarded as food. This leads to the interesting question of whether it would be possible to disguise feedstuffs with more agreeable odors than those of mercaptans, so that rats would not regard them as food."

—*American Chemical Society.*

100,000 Japanese Beetles Will Be in "Suicide Squad"

Grubs Will Be Inoculated With Fatal Disease in War on Pests.

NEW HAVEN, CONN.—The blitzkreig starts in Connecticut on July 1. One hundred thousand Japanese beetle grubs will comprise the suicide squad for an anti-Japanese beetle campaign.

The grubs were taken from a Bridgeport golf club turf and then shipped to New Jersey for inoculation with milky disease, fatal to Japanese beetles. Later, their bodies, in which the bacteria have multiplied a million-fold, will be ground into dust and returned to Connecticut for distribution on half-acre plots at three and one-half mile intervals thruout the badly infested areas of the state.

The value of the milky disease method of beetle control depends upon the fact that beetles lay their eggs in turf and the young grubs feed on the grass roots during part of their underground existence.

After the Connecticut state agricultural experiment station at New Haven had made a preliminary survey of the state, the Bridgeport area was chosen for the gathering of grubs. One hundred thousand were dug in two and one-half days. These were boxed and shipped to the United States bureau of entomology laboratory at Moorestown, N. J., where there are facilities for handling.

Each larva is inoculated with a few bacteria of milky disease and allowed to rest in soil incubators for about two weeks. By the end of this period the disease germs multiply to as many as 50 million in a single body and the grub is about to die. Their bodies are then ground to powder, mixed and returned to Connecticut. The germ-laden dust is then distributed in selected areas.

Fireflies: A Menace?

Having heard that their city may be blacked out in the event of air raids, citizens of Kingston, Jamaica, have shown concern over the possibility that the fireflies which infest the city may betray it to enemy raiders. A recent letter to a Kingston newspaper suggests that a campaign to exterminate fireflies get under way immediately.

Pest Control in the News

Book Lice

QUESTION—How can the tiny white, almost transparent insects that infest newly constructed apartments be disposed of?—J. S., New York.

ANSWER—Those insects are apparently the same as the ones commonly called book lice. In dry air, the warmer the better, these insects dry up and disappear. Closing a room and turning on the heat will end them.—*N. Y. Sun.*

Anti-Mouse Treatment

QUESTION—My summer house has no basement. In leaving it closed, I am worried about linens, blankets, rugs, etc. How can I protect them against mice? And what about upholstered furniture? — D. V. B., Lake George.

ANSWER—Fabrics should be protected against dampness. To keep mice away, use quantities of moth balls. Cover the fabrics and upholstery with them, and scatter more all over each room. All openings into the house should be closed with wire nettings or otherwise, and you should put a box over the chimney top to keep small animals from entering, and also to prevent dampness from coming in.—*N. Y. Sun.*

Infestation of a High School by Oeciacus vicarius Horv

By G. ALLEN MAIL, *Department of Agriculture, Livestock Insect Laboratory, Kamploops, B. C.*

EARLY in June, 1940, communications were received by the Livestock Insect Laboratory of the Dominion Department of Agriculture at Kamloops, British Columbia, relative to an insect pest invading the high school at Banff, Alberta. A letter from a local physician stated that many of the students, especially the girls, were bitten, the bites "showing a reddened, swollen, itchy area, two or three inches in diameter." So many students complained that the school was shut down and the authorities fumigated the building with formaldehyde gas; this treatment, however, proving unsuccessful. Specimens of the insects were then sent to the Kamloops laboratory and proved to be the swallow bug, *Oeciarcus vicarius* Horv. The school authorities were thereupon instructed to destroy any swallow nests present and fumigate with cyanide. From subsequent reports it was learned that swallows have nested under the eaves of the building for some years but no effort was made to dislodge the nests until this spring. Two weeks prior to the reports of insect bites, the school board dislodged some of the nests by the use of a hose and water under pressure. Obviously the pests so disturbed had made their way into the building by way of crevices and cracks around the doors and windows, soon penetrated every room in the building and their presence became evident following complaints by students that they had been bitten. The bugs were locally determined as bed bugs and parents of the students attacked were greatly concerned over the possibility of their own homes becoming infested.

The nests of the swallows were destroyed and the building fumigated with hydrocyanic acid gas. The results were apparently satisfactory and the school reopened in time to permit final examinations. Early in July, however, the writer visited the school and it appears that swallows are rebuilding their nests. Whether the school will be reinfested remains to be seen.—8-7-40.

*Contribution No. 2019, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Canada.

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Barium Compounds as Poisons in Firebrat Baits[1]

By CHARLES H. RICHARDSON and EDWIN J. SEIFERLE, *Iowa State College, Ames*[2]

During the course of an investigation of stomach poisons, it was found that barium carbonate possessed considerable toxicity to the firebrat, **Thermobia domestica** (Packard), when incorporated in a suitable bait mixture. Since barium carbonate is definitely lower in cost than the poisons currently recommended for firebrat baits except arsenic trioxide, and is safer than the latter poison for use in the home, it seemed advisable to examine it further. At the same time twenty-five other barium compounds were tested for toxicity to this insect. The experiments were made at Ames, Iowa, in the period from January 4 to August 15, 1938.

HISTORICAL—As insecticides barium compounds are not new. The older European literature contains many references to barium chloride, which is reported to have both stomach-poison and contact-poison properties (Trappmann 1927). Barium fluosilicate has been tested on a large number of insect species, and has found some practical applications. Barium carbonate has also been tried by a number of workers with variable results (Lefroy & Finlow 1912-14; Moore & Campbell 1924; Marcovitch 1928; Peairs 1936). So far as tested, barium chromate, fluoride, oxalate, peroxide, stearate, sulfate and thiosulfate have shown no marked toxicity to insects (Lefroy & Finlow 1912-14; Jackson and Lefroy 1917; Moore & Campbell 1924; Richardson & Seiferle 1938).

The earliest reference to the use of a barium compound in a bait for firebrats or other lepismatids seems to be that in Spencer's unpublished thesis.[3] This author used barium carbonate at about 12 per cent of a flour-meat mixture, testing the bait on a single pair of firebrats; the insects died in 90 and 122 hours.

In Australia, a species of silverfish, **Ctenolepisma longicaudata** Escherich, has been controlled by baits containing barium fluosilicate (**Anon.** 1935; 1936a; 1936b; 1937; Lindsay 1938). Seiferle **et al.** (1938) have investigated baits containg barium fluosilicate for the firebrat. They found this compound less toxic than sodium fluoride and sodium fluosilicate, on the basis of median lethal time, but more toxic than sodium fluoaluminate (cryolite) when comparisons were made of median lethal times for equal concentrations of poisons. In their paper most of the literature pertaining to poisons tested in firebrat baits is cited.

Barium compounds are definitely toxic to vertebrate animals. McNally (1937) cites instances of recoveries of man from doses as large as 35 grams, and deaths from doses as small as 10 to 12 grams. He states that fatal poisoning of humans by barium salts is comparatively rare. Schwartze (1920) found that barium carbonate was two-thirds as active as barium chloride to rats when fed by mouth. The chromate was practically nontoxic, and a barium soap (chiefly barium palmitate) was about equal in toxicity to barium carbonate for the same animal.

Since the action of barium carbonate on vertebrate animals is slow so that the chance of death from accidental or intended poisoning is smaller than that from many other poisons, this compound is generally regarded as one of the safer poisons for use in rat baits.

PLAN OF EXPERIMENTS. — In general, the baits, and method of administering them, were those employed by Seiferle, **et al.** (1938). A small quantity of bait was placed in a shell

Table 1.—Mortality of the firebrat from barium compounds in baits at 4 per cent concentrations. Time 96 hours. Temperature 38°C.

Compound	Mortality Group	Actual Mortality†	Barium in Compd.	Sol. of Compd.‡	Sol. of Ba
		Per cent	Per cent	g. per 1.	g. per 1.
Barium bromide	0-2	0	41.2	1130.	522.0000
Barium chromate		0	54.0	0.0053	0.0029
Barium diphenylamine sulfonate		0	21.9	2.	—
Barium diphosphate		0	58.8	0.05	0.029
Barium iodide		0	35.1	2300.	808.
Barium sulfate		0	58.8	0.0031	0.0018
Barium thiosulfate		2	51.3	0.5	0.26
Barium chloride		2	56.2	402.	265.
Barium nitrate		2	52.6	137.	72.
Barium oleate		2	19.6	Insol.	—
Barium chlorate	3-25	4	42.6	539.	243.
Barium perchlorate		4	40.8	3025.	1236.
Barium sulfide*		4	81.1	Decomp.	—
Barium formate		6	60.4	338.	204.
Barium acetate		8	50.2	768.	413.
Barium iodate		14	27.2	0.39	0.11
Barium oxide		22	89.6	69.	62.
Barium hydroxide	26-50	26	43.5	77.	62.
Barium tartrate		31	45.3	0.34	0.16
Barium fluoride*		35	78.3	1.62	1.28
Barium bromate		36	33.4	12.	4.
Barium triphosphate	51-75	51	68.4	Insol.	—
Barium peroxide		56	81.1	Insol.	—
Barium oxalate*		62	56.4	0.12	0.07
Barium carbonate	76-100	82	69.6	.03	0.02
Barium fluosilicate*		91	49.2	0.41	0.21

* Repellent compound.
† Based on at least 5 subsamples of 10 insects.
‡ Solubility data from Comey & Hahn (1921), Merck (1930) and Seidell (1919).

[1] Journal paper J-755 of the Entomology and Economic Zoology Section of the Iowa Agricultural Experiment Station, Ames, State project 137.

[2] The writers wish to acknowledge the efficient aid of Miss Jean Austin during this investigation.

[3] Life history and control measures of the silverfish, **Thermobia domestica** (Packard). Univ. of Illinois, Urbana, E. A. Spencer, 1924.

vial and a single firebrat was introduced. The bait consisted of rolled oats, sugar and sodium chloride, finely ground and mixed in the proportions, 200:10:5. A dye was added to the bait in the concentration of 0.5 per cent, and the poison, with a few exceptions, at 4 per cent concentration. Nearly all the barium compounds were of chemically pure, reagent grade; a few of lower grade were the best commercial products obtainable on the American market.

The dye, **Scarlet R**, a nontoxic bisazo compound, was added to determine whether feeding on the baits had taken place. Insects that consumed relatively large quantities of a bait containing **Scarlet R** assumed a deep red color easily visible through the integument by means of a hand lens. On the other hand, insects that ate little showed at most a slight pink or pale reddish color. The presence of the dye was confirmed at the conclusion of the experiment by dropping the insect in chloroform which immediately intensifies the color. In this manner, the ingestion by the insect of more than traces of the bait could be positively detected. The selection of **Scarlet R** to detect feeding, and its use at the 0.5 per cent level, are the outcome of experiments with a considerable number of dye compounds. The results of these experiments will be published later.

In an experiment there were ten adult insects, each insect in its individual vial. The criterion of death was the inability of the insect to move when the antennae, legs or tarsi were pinched with forceps. If a compound proved appreciably toxic, the experiments were replicated 10 times; otherwise there were 5 replications. Examination of the experiments were made at 24, 48, 72, and 96 hours.

Table 2.—Percentage mortality of firebrats on baits containing barium carbonate and sodium fluoride.

Compound and Concentration		Percentage* Dead In 24 hrs.	48 hrs.	72 hrs.	96 hrs.
Barium carbonate	4%	27	55	75	82
Sodium fluoride	4	27	51	77	89
Barium carbonate	6%	27	66	78	89
Sodium fluoride	6	51	66	77	91
Barium carbonate	7%	24	59	79	93
Sodium fluoride	7	21	52	71	88
Barium carbonate	8%	43	75	91	96
Sodium fluoride	8	33	53	71	90

* Based upon 10 or more subsamples of 10 insects.

Controls were of three kinds: a standard poison bait to control mortality, made of the same kinds and proportions of materials as the experimental baits except that it contained 4 per cent sodium fluoride; a standard food like the standard poison bait but without sodium fluoride; and a starvation control consisting only of a vial and a paper perch for the insect to rest upon. The purpose of the latter control was to serve as a check on the ability of the insects to survive the experimental period (96 hours) without feeding. Of the 790 insects starved for 96 hours, only 0.5 per cent died of all causes during this time.[1] All experiments were maintained at 38 degrees C. and a relative humidity of about 70 per cent.

RESULTS. — The results of the tests on the several compounds are presented in table 1. Comparison of the mortality data for each barium compound was made with that for the standard sodium fluoride bait, the chi-square test being used in all doubtful cases to determine significance. The comparisons were always made

[1] Recent experiments show that the insects can apparently derive some nourishment from the paper (medium-weight typewriter bond) of which the perches were made. The paper perches were common to all experiments and controls.

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with data derived from experiments which extended over the same period of time. Mortalities at 96 hours only are given in the table. All compounds except barium carbonate and barium fluosilicate proved significantly different in mortality from sodium fluoride.

Similar comparisons were made to determine relative repellence, the percentage of insects colored by **Scarlet R** in the experimental baits at each of the 4 time levels being compared with the percentage colored in the standard food baits at the same time levels. The 4 compounds which proved to be repellent on the basis of this information are designated by a footnote in table 1.

The mortality from baits containing barium carbonate is compared in table 2 with that from sodium fluoride baits at 4, 6, 7 and 8 per cent poison concentrations.

In figure 1 are given the repellent values (rate of coloring with **Scarlet R)** for barium carbonate and sodium fluoride at the same 4 concentrations and the same times as in table 2. The rate of coloring on standard food (without poison) is also shown on this graph.

The sexes of the insects which died in the experiments were recorded and the sex ratios were examined for evidence of differential toxic effects of the compounds. The chi-square test was used to determine whether the observer ratios departed significantly from the theoretical 50:50 ratio. The results are given in the discussion.

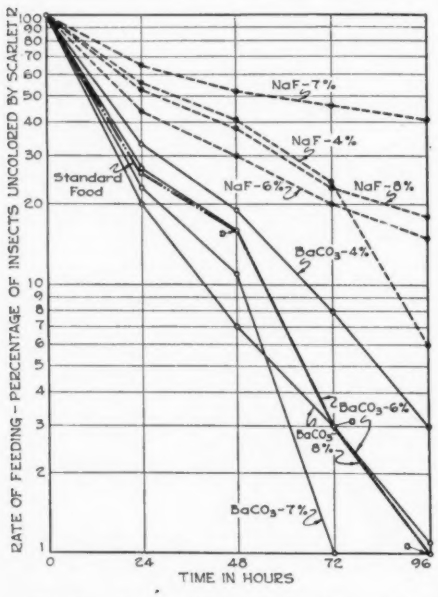

Fig. 1.—Rate of feeding on baits containing barium carbonate and sodium fluoride; and on unpoisoned food. The data are based on the percentage of firebrats which at each observation were not yet colored by Scarlet R. Each point on the curves represents information derived from at least 10 subsamples of 10 insects.

DISCUSSION.—Inspection of table 1 shows that no compound of high solubility in water at 38 degrees C. was markedly toxic, and that most of the appreciably toxic compounds were of relatively low solubility (62 grams of barium per liter or less). However, there are several compounds in the nontoxic group, notably barium sulfate and barium chromate, which are almost insoluble in water and probably insoluble in the digestive tract of the firebrat. Barium sulfide was so repellent that even if it were highly poisonous few of the insects consumed enough to obtain a lethal dose.

With reference to the more active compounds, the toxicity of barium peroxide is probably associated with the oxidative activity as well as the barium content of the molecule. The toxicities of barium oxalate and barium fluosilicate are no doubt the result in part of the action of the respective acid radicals; and the higher mortality obtained from the latter compound is in accord with the greater toxic action of the hydrofluosilicic acid radical. So far as figures are available, barium carbonate is exceeded in insolubility in these compounds only by barium sulfate and barium chromate. The solubility increases considerably in the presence or carbonic acid, and the compound is readily decomposed by stronger acids. It seems highly probable, therefore, that barium ion is released readily from barium carbonate in the digestive tract of the firebrat. But the high mortality produced by this compound probably cannot be attributed entirely to the barium content, or to the ease with which barium ion is released in the digestive tract. Relative freedom from repellent properties is probably a factor of importance in its toxicity.

Only four of the compounds were significantly repellent, barium sulfide, as mentioned above, being most active in this respect. Barium oxalate bait was somewhat repellent up to 48 hours, but after that most of the insects fed on this bait. Barium fluosilicate and barium fluoride baits were repellent during the first 24 hours but not thereafter.

In this connection it should be stated that while **Scarlet R** will distinguish a readily-eaten from an avoided bait, it does not afford a quantitative measure of the bait consumed by the insects that have become definitely colored. Rather marked differences may, therefore, have existed in consumption of the various baits which imparted a definite red color to the insects.

No significant difference was found between the mortality from the barium carbonate and the sodium fluoride baits at 4 per cent poison concentrations, (Table 2). At the 6 per cent concentrations, the performance of the baits was almost identical at all time levels except 24 hours. The higher mortality of sodium fluoride during this time interval was apparently anomalous. At 8 per cent concentration, significant differences between the two poisons were obtainable at all time-levels except 96 hours when the mortalities became almost identical. Evidently barium carbonate and sodium fluoride produce the same or closely similar mortality when the firebrat is permitted to feed **ad libitum** on the baits.

The repellent effect of sodium fluoride was noticeable at all concentrations. Inspection of the curves in figure 1 shows that the rate of coloring by **Scarlet R** of the insects that fed on these baits was distinctly slower than the rate of coloring on the barium carbonate baits. Furthermore, the rate of coloring on the latter baits was similar to that on the unpoisoned standard bait. Apparently, within the range of the concentrations used barium carbonate has little effect on the rate of feeding while sodium fluoride slows up the feeding process. It is of interest to note that Schwartze (1920) found that the average intake by the rat of foods containing barium carbonate was approximately the same as that of unpoisoned foods.

At 96 hours, the mortality from sodium fluoride is about the same as that from barium carbonate. Yet, it is certain that baits containing the former compound are eaten less readily. Possibly sodium fluoride is more toxic to firebrats than barium carbonate on a dosage-weight basis; but Snipes **et al.** (1936) have stated that sodium fluoride has a contact action on this insect. The results of this investigation are concordant with this view, for it was noticed repeatedly that some of the insects died which had eaten mere traces, if any, of the poisoned bait.

The sex ratios of the insects that died in any series of tests, when the number was large enough, always agreed reasonably well with the theoretical 50:50 ratio. For example, barium peroxide bait killed 27 males and 42 females, barium oxalate bait 29 males and 33 females and barium

fluoride bait 36 males and 55 females. Baits for which smaller numbers of insects were available furnished ratios which indicated agreement with theory. A closer agreement was found in the sexes of the 1,073 insects that died in the standard sodium fluoride baits, 49.6 per cent being males and 50.4 per cent females. The conclusion from these results is that within the concentration limits the barium compounds and sodium fluoride do not exert a pronounced selective toxic action on the sexes of the firebrat.

PRACTICAL APPLICATIONS. — In view of its marked toxicity, absence of repellent properties, low toxicity to man, and domestic animals and favorable cost, barium carbonate is recommended as the toxic ingredient of baits intended for use in dwellings, libraries, storehouses and other places infested with firebrats. The bait ingredients and their proportions by weight are as follows:

	Parts
Rolled oats, finely ground	86
Powdered sugar, confectioners'	5
Table salt, powdered	2
Barium carbonate	7

The ingredients should be thoroughly mixed in the dry condition to form a fine powder, without lumps. The same procedures and cautions observed in the use of the sodium fluoride bait (cf. Snipes **et al.** 1936) should be followed in the application of the barium carbonate bait.

SUMMARY. — Twenty-six barium compounds were tested for mortality to the firebrat. **Thermobia domestica**, in a food mixture at 4 per cent concentrations. The insects were allowed to feed **ad libitum** on the baits, observations for mortality being made at 24, 48, 72 and 96 hours. Seventeen of the compounds were nontoxic or produced mortalities in 96 hours of less than 25 per cent. The compounds of greatest solubility in water are in this group. Several of the compounds in this group whose solubilities in water are low probably owe their low toxicity to extreme insolubility in the digestive tract of the insect. Barium sulfide was so repellent that little of the bait containing it was eaten. Undetected differences in bait consumption may explain some of the observed differences in mortality.

The five most toxic compounds are placed in three groups on the basis of mortality in 96 hours: barium fluosilicate and barium carbonate followed by barium oxalate and then by barium peroxide and barium triphosphate. The difference between the last two groups may not be significant. At concentrations with 4 and 8 per cent barium carbonate produced approximately the same mortality as sodium fluoride; and it possessed little if any repellent effect while sodium fluoride rendered the bait noticeably repellent.

No significant sex differences in mortality were observed in these experiments.

A practical bait containing barium carbonate as the toxic ingredient is described.—6-7-40.

Reprinted from Journal of Economic Entomology 33 (6):857

Pigeons

QUESTION—How can we get rid of pigeons that are nesting on our roof? If we destroy their nest, I have been told they will return.—T. F. H., New York.

ANSWER—You might try a remedy that has been used with success in a Massachusetts city. This was to place one or two toy snakes on the roof. The pigeons took it for granted that the snakes were alive and kept well out of danger. Nothing should be done during the nesting season. It would be cruel to drive off the parents while eggs were being hatched or with nestlings too young to take care of themselves.—*N. Y. Sun.*

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Roach Control in the Mill

(Continued from Page 14)

These sprays usually contain the active principals of pyrethrum or other synthetics which are similar in their action and for this reason, everything stated about pyrethrum power would more or less apply to the effectiveness of mill sprays.

The essential thing to remember in using a spray, is that it has little or no residual action and only those roaches which are hit at the time of application can be expected to succumb. In practice, this means that an occasional light spraying will be of little value and is usually time wasted. If roaches are a problem, the man doing the spraying should know something of their habits and preferential hiding places. With this in mind, he can usually get at the source of trouble with no difficulty and clean them out with a few thorough applications.

In connection with the use of mill sprays, it cannot be pointed out too strongly that a poor spray may of times be of more harm than good. If a valuable man's time is being delegated to insect control, much of it may be utterly wasted through application of materials which are not effective.

Roaches are large and sturdy insects; to kill them strong insecticidal sprays are necessary. The best method of insuring that the spray is suitable is to purchase them from a company which has adequate means of testing and standardizing its product under actual mill conditions. Cheap fly sprays, which are generally recommended for roach control are usually too weak to insure proper results and justify the use of time necessary for their application.

Fumigation

Fumigation, as it is normally practiced for the control of cereal pests, will also control an infestation of roaches if the concentration of gas is high and the center of the infestation is located within the fumigation area. In many instances, however, this is not the case and as a result fumigation cannot be entirely relied upon. Roaches have the habit of dropping their egg cases in out of the way places, sometimes hundreds of feet away from the cereal products they are feeding on. For this reason, fumigation for roaches alone cannot be recommended either from the standpoint of efficiency or economy.

Roach Traps

Various types of roach traps are offered for sale and while these mechanical devices are effective in catching a great many roaches, their use will not give control. Roughly, they consist of intricate boxes or cages containing an attractive roach food and built so that roaches may easily get into them and cannot afterwards escape. The destruction of the roaches is affected either by the poisoned bait, or by dousing them in hot water. As far as the writer can see, the only practical purpose they serve is to catch live roaches for test work or experimental purposes.

Poison Baits

From the theoretical point of view, one of the easiest and cheapest means of roach control is through the use of poisoned baits. These baits consist simply of a suitable food which will attract the roaches and a poison which will kill them.

Much is known about the food habits of the roach, and at least a dozen poisons are available which will kill them when ingested in minute quantities. In spite of this, so-called roach tablets or roach baits are generally not effective in mills or food plants. The principal reason for this lack of effectiveness is the great amount of food which is available for consumption, thus the possibility of a roach eating the particular poisoned food is very small indeed. Among the roach baits, the most effective are those containing phosphorus. Their value as a control measure is limited almost entirely to the large American roach and because of the highly poisonous nature of phosphorus they can be used in food plants only with great care.

Successful roach control is dependent upon the use of the right material and thoroughness of application. If a vigorous effort towards insect sanitation is made before roaches become prevalent the job is an easy one.

The 17-year locust spends .0033 per cent of its entire life as an adult.

A short maturity but a merry one, eh?

Camouflage for Mosquitoes

WASHINGTON. — The Army is experimenting with a camouflaged netting to protect soldiers from mosquitoes. White mosquito bars are being dyed a new olive-drab shade to blend with the landscape and throw the insects off their objective.—*N. Y. Times.*

ANIMALS

Rodents at Work

Last week these U. S. rodents made this news:

In Mount Vernon, N. Y., a squirrel (*Sciurus vulgaris*) scampered across high-tension wires, caused a short circuit that broke a wire which fell on oil-soaked ties, starting a fire that held up traffic on the New York, New Haven & Hartford Railroad for an hour.

In Salmon, Idaho, five beavers (*Castor canadensis*) came downstream on Jesse Creek and built a dam within 100 feet of a site selected by reclamation engineers, thus stabilizing the uncertain water supply and saving the city the cost of a dam.

In New York's Queen County Court, Judge Charles Colden recessed proceedings to halt a distracting grating noise coming from under the counsel table. The noise proved to be a house mouse (*Mus musculus*) calmly gnawing the sole of a newspaper reporter's shoe. Newshawk William Alexander, of the Long Island *Daily Press*, had been so busy he hadn't noticed. Judge Colden had the mouse caught and executed. Passing lightly over the mouse's fate, the New York *Times* soberly regarded Newshawk Alexander, praised his powers of concentration, added: "He approaches his duties with single-mindedness. He looks up, not down. It is possible to foresee a bright future for him if mice don't consume him first."

Battery Run Down?

As most of us know, and but few of us practice, concentration on the matter in hand is the price of accomplishment.

It is said that Thackery could sit down in a room full of people and write out a chapter for one of his novels, undistracted by the general conversation going on around him.

The average man cannot even hold his thoughts to one subject in perfect solitude. His mind goes wandering away to more amusing fields, when it should be attending to its "knitting."

We are forever starting something, and then shifting to something else before the task is completed. The unfinished task kills all the real pleasure of work and undermines the will power.

It is well to consider will power as so much stored energy—like a battery—slowly charged by rest and relaxation, and quickly used up during the day's work . . . so unless a definite task is completed each day, the "battery" is discharged of much of its energy without real accomplishment.

New Worry For Mosquitoes

Kirksville Woman Uses Vacuum Cleaner on Pests

Kirksville, Mo.—A plague of mosquitoes has sent Kirksville residents scurrying for effective combat methods.

Mrs. C. J. Baxter found a remedy in the use of her vacuum sweeper. Holding a cleaner attachment while seated on the porch or in the house, she says, cleans the pests from the air in a jiffy.

—*Kansas City Star.*

Entomological Literature

PROTECTING STORED WHEAT FROM INSECTS—By F. A. Fenton (June, 1941) C-95.

This circular gives brief practical instructions on how to prevent insect infestations and on how to fumigate infested bins.

Publication may be ordered by postcard or letter from Mailing Clerk, Agricultural Experiment Station, Oklahoma A. & M. College, Stillwater, Oklahoma.

INSECTS IN RELATION TO NATIONAL DEFENSE

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Circular 7: Mosquitoes
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Circular 10: Bedbugs
Circular 13: Fleas
Circular 14: Chiggers
Circular 17: Stable Flies
Circular 18: Screwworms

The foregoing circulars issued by the Bureau of Entomology and Plant Quarantine, Washington, D. C., under the general title "Insects in Relation to National Defense" were prepared primarily to aid agencies which may have a direct relation to National Defense in combating of insects. The series of circulars does not consider the relation of insects to the production of foodstuffs and supplies.

The edition of these circulars is limited and it is desired to place them in the hands of agencies directly associated with National Defense and make them available to entomologists and others who may have occasion to recommend to National Defense agencies measures for the control of various kinds of insects. The series does not replace regular Farmers' Bulletins, and the distribution is necessarily limited.

OBSERVATIONS ON THE USE OF "PHENOL" LARVICIDES FOR MOSQUITO CONTROL

By Frederick L. Knowles, Associate Physicist; Wiley V. Parker, Engineering Aide, and H. A. Johnson, Sanitary Engineer, United States Public Health Service.

Public Health Reports—Vol. 56—August 15, 1941—No. 33. For sale by Supt. of Documents, Washington, D. C. Price 5c.

CONTROL OF INSECT PESTS OF GRAIN IN ELEVATOR STORAGE

By R. T. Cotton, senior entomologist, and Geo. B. Wagner, associate entomologist, Division of Cereal and Forage Insect Investigations, Bureau of Entomology and Plant Quarantine. Farmers' Bulletin No. 1880, U. S. Dept. of Agriculture, issued August, 1941.

Contents: Insects that cause trouble in elevators; sources of infestation; control of insects in terminal elevators, etc.; residual odors of fumigants on grain; dusts of little value in protecting stored grain; treatment of grain in country elevators; treatment of grain in warehouse storage; treatment of bagged grain under tarpaulins.

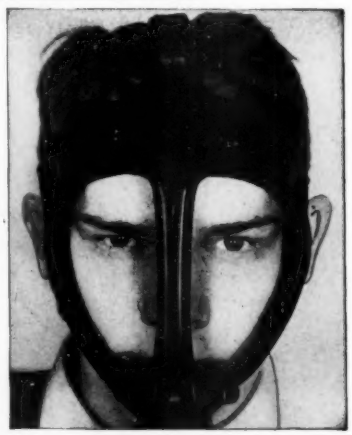
This bulletin supersedes the portions of Farmers' Bulletin 1483 pertaining to insect pests of grain stored in country or terminal elevators and warehouses. Farmers' Bulletin 1811 supersedes the other portions of Farmers' Bulletin 1483; namely, those that relate to the control of insects in farm-stored grain. Farmers' Bulletin No. 1880 is for sale by the Superintendent of Documents, Washington, D. C. 5 cents.

PRELIMINARY RECOMMENDATIONS TO FUMIGATORS USING METHYL BROMIDE OR MIXTURES CONTAINING METHYL BROMIDE AS A FUMIGANT*

The United States Public Health Service published the foregoing titled leaflet on May 16, 1938. All persons interested in using this fumigant should obtain copies of this leaflet. This publication contains the warning that, "While methyl bromide is less toxic to man than certain other fumigants, all persons fumigating with methyl bromide or mixtures containing methyl bromide, or persons entering fumigated rooms, cars, or sheds to open ventilators or to unload fumigated materials, observe precautions used with other toxic fumigating gas. Experience indicates that adequate precaution wil obviate danger of injury by this gas."

*Excerpt from Farmers' Bulletin No. 1880.

P.C.I. Fumigation Standards Make Safety First a Must — Thoughtful Fumigators Everywhere Are Equipping Their Service Staffs With Acme Full Vision Gas Masks* . . .



And here's why:

1—FULL VISION, an exclusive ACME feature, affords the wearer unobstructed vision . . . thereby making for greater safety and efficiency . . . Thus minimizing possibility of accidents, reducing their ratio and the extent to which they do they bring about lower insurance costs.

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RUMETAN ZINC PHOSPHIDE

Pfaltz & Bauer, Inc.

Empire State Bldg. New York

The Effect on Humans of the Ingestion of the Confused Flour Beetle

By H. B. MILLS and J. H. PEPPER, *Montana Agricultural Experiment Station, Bozeman*

EDITOR'S NOTE—*Reprinted from Journal of Economic Entomology* 32 (6) :874.

DURING the past year, information has been requested from the Montana Agricultural Experiment Station concerning possible ill effects which might result from the ingestion of the confused flour beetles, *Tribolium confusum* Duv., accidentally included in cereals.

No information covering this point was found in the literature, and because certain legal actions involved this question, experiments were undertaken to discover what the effects of ingestion of these insects might be.

TESTS WITH RATS.—Experiments were first conducted on rats. Twelve young rats, weighing approximately 40 grams, were divided into four groups on March 31. They were starved one day and, on April 1, three groups were fed 10 grams per individual of stock rat ration to which had been added 1 per cent by weight of crushed adult beetles. One lot contained raw adult beetles, another cooked adults and the third dead adults from a flour culture. The fourth was kept as the check and fed the same weight of stock rations without addition of beetles. On the days following, the food cups were kept full of insect-free stock ration. All four groups were weighed and examined daily. The percentages of original weight were computed and are presented in Table 1.

Table 1.—Per cent of original weight of young rats fed 1 per cent by weight of adult confused flour beetles on April 1.

Date	Raw Adults	Cooked Adults	Desiccated Adults	Check
April 1	90.3	90.0	89.8	89.5
April 2	109.6	109.0	107.8	107.9
April 3	116.9	116.5	113.4	112.8
April 4	124.2	123.4	120.5	119.3
April 5	135.5	132.5	129.0	127.3

Nine adult rats were divided into three groups and in a manner fed similar to the others except that one group was fed a 1 per cent by weight ration of raw larvae and another 1 per cent by weight of boiled larvae. The third group was kept as the check. Daily weights and observations were taken. The percentages of original weight are shown in Table 2.

Table 2.—Per cent of original weight of adult rats fed 1 per cent by weight of larval confused flour beetles on April 1 and 2.

Date	Raw Larvae Fed April 1	Cooked Larvae Fed April 2	Check
April 1	91.1	91.4	92.9
April 2	94.0	101.9	92.7
April 3	101.2	105.4	98.0
April 4	103.3	106.0	105.4
April 5	104.7	107.2	106.8

It will be seen from Tables 1 and 2 that the inclusion of flour beetles at the rate used produced no effect on the weights of either the young or adult rats. Daily examination did not reveal any digestive disturbance whatever. The numbers of insects used were far in excess of even a heavy population in cereals. From the above data it would not be expected that the ingestion of these insects by humans would produce any harmful effects.

TEST WITH HUMAN BEINGS.—On the basis of the information obtained from the rat tests, a trial was carried out on human beings. Four normal healthy individuals varying in age from 28 to 44 years volunteered for this experiment. Each individual ate 25 adult confused flour beetles, 25 larvae, a few pupae, cast skins, eggs and some excrement boiled in approximately 2 ounces of oatmeal. Two individuals had had but a cup of coffee previously on the morning of the trial, and 2 ate normal breakfasts. The infested oatmeal was eaten at 9 a. m. and no further food was taken until noon.

Detailed blood and urine analyses were made on the day previous, the day of the trial and on the 2 days following. Bowel habits and general health were noted throughout the course of the experiment. No deviations from the normal for each of the individuals, either in the analyses or in general condition, were noted.

Again the number of flour beetles ingested was far in excess of populations which would be encountered normally in infested cereals.

No evidence was gathered in the above experiments which would indicate that injury to human beings would result from the ingestion of confused flour beetles as they may accidentally occur in cooked cereals. —5-26-39.

Creed of a Modern Salesman

By Wilfred A. Peterson

I believe that an ounce of fact is worth a ton of ballyhoo;

I believe that the day of desk-thumping is over and that a big idea is more important than a big fist;

I believe in the abolishment of bunk, hokum and black magic;

I believe that smutty stories are passe and that every sale depends on a straightforward presentation of what my product will do for my prospect;

I believe that the Go-Giver always will surpass the man who is interested only in Go-Getting;

I believe that quality is a greater selling-point than price;

I believe that pleased customers are my greatest asset;

I believe in the constructive force of creative thinking;

I believe that a loud voice is taboo and that low words are charged with sincerity and strength;

I believe that listening often is more important than talking;

I believe that when I knock a competitor I block my own progress;

I believe that the confidence of a prospect or customer is a sacred trust that never should be violated;

I believe that I must sell myself before I can sell others;

I believe in the gospel of courage, confidence and good cheer;

I believe in the radiant power of a smile;

I believe in the victorious mental attitude;

I believe in shaves, shoeshines, haircuts and clean collars;

I believe that salesmen are creators of prosperity, progress and happiness, and I am proud to list my name among those who sell;

I believe in old-fashioned hard work;

I believe in keeping my chin up, my head high and my enthusiasm keen;

I believe that my success is up to me.

Squirrels and Moles

Squirrels Eat Twigs When Nuts Are Scarce

Squirrels are sometimes destructive to shrubs, shade and ornamental trees. When ground food is not available because of heavy snows, squirrels resort to feeding upon twigs. The leader or terminal shoots of coniferous plantings are often cut off, and this is likely to occur chiefly with Scotch Pine and Norway Spruce. This damage causes the trees to become stunted or deformed. One man near Winchendon, Mass., estimated a loss of $1,000 to his shrubs during one winter. In one instance, two pairs of squirrels cut 2,886 elm twigs with 14,430 leaves in a little more than one day. Squirrels have been known to attack newly sprouting bulbs during the spring months. Not only that—they will dig them out before they sprout.

If it becomes necessary to control squirrels, they can be trapped easily in a box or wire cage trap and transferred to other localities. The traps should be set at the base of trees where the squirrels have been observed feeding, or at other places along their route of travel. During extremely severe winters, it might be well to feed them a mixture of corn, hard-shelled nuts, and sunflower seeds in order to discourage their eating other vegetation. Local and state trapping regulations regarding squirrels should be observed in this connection.

Moles Are More Familiar Invaders

Every gardener is familiar with the problem of moles. Each spring and summer I receive a multitudinous number of requests for assistance in the control of moles. There are five groups of moles in the United States, but their general habits are the same except that the Pacific Coast moles make mounds of dirt at the surface whereas the East Coast forms do not. The mole is not a rodent. It can be distinguished from the rodent by its absence of incisor teeth and by its plush-like fur, pointed snout, and its short, stout, front limbs.

Moles live mostly underground, feeding upon earthworms and insect larvae, although they may consume some vegetation. The damage done by moles is mostly mechanical, that is, plants are uprooted or displaced rather than eaten. Their runways admit air to the roots of the plant, or the stems of plants may be broken so that the plants later wilt or discolor. Evidence of mole activity is plainly seen in conspicuous ridges in the sod or soil crust, caused by their runs just below the surface. Several feet of runs may be made each day by one mole in search of food. During periods of dry weather, their fresh runs are not so readily observed, since their runways go deeper as the moles follow the insect life.

As to the control of moles, I only wish that we had an easy answer. Poison bait is generally ineffective, for moles prefer live animal matter and they detect poison very readily. It is difficult to apply poison gases throughout their extensive runs, and in addition, moles tend to avoid them by quickly digging into the soil. However, calcium cyanide dust may act as a repellent so that these pests move to other less valuable areas, and under some conditions the cyanide dust may destroy a few. Substances such as lye, paradichlorobenzene, naphthalene, moth balls, and castor beans introduced into mole runways have little if any effect as repellents.

Trapping

Trapping is the most applicable and satisfactory method for mole control, but it is successful only if the habits and instincts of the mole are carefully considered. Special mole traps on the market, used properly, will rid a garden of moles. The successful operation of all mole traps depends upon the mole's habit of reopening any runways filled with dirt. The selection of a frequently used runway for a trap set is of prime importance. Since many runways are not used more than once, it is essential that main runs in constant use be found. When setting mole traps, wait for a day or two after a heavy rain, when near-surface active runs will be visible. Examine the border of the garden for their runways to and from the adjoining fence or hedgerows, fields, or woods. A four-inch furrow about the border of a garden will assist in determining whether moles are entering the gardens, as any breaks in their runways will be quickly repaired. Frequently it is possible to capture all moles infesting a garden by trapping along the border. The trapper can often locate the used tunnels by stamping down the conspicuous ridges in several places for two consecutive days; on the third day it will be noted that the regularly used runways will be raised again. Thus, a few well placed mole traps will serve in removing the animals from a large area. EDITOR'S NOTE: *Since squirrel and mole control have occasioned P. C. O. inquiry, the foregoing material excerpted from a talk by E. M. Mills, Biological Survey, U. S. Dept. of the Interior on the subject of ROUTING RODENTS should be of interest. It was presented as a Radio Garden Club, New Brunswick, N. J., broadcast over WOR and other stations of the Mutual Broadcasting System.*

New Microscope Makes Hair Look Like Tree, Magnifies Objects 100,000 Times True Size

A new giant electrical microscope that, in addition to magnifying submicroscopic objects to as high as 100,000 times their natural size, also can look inside bacteria, blood cells and other biological substances in the realm of the infinitesimal, has been developed at the RCA laboratories, it was announced in New York recently.

"What Advertisers Should Know"

"What Every Advertiser Should Know . . . before implying that the United States Government or its personnel approves his goods" is the title of a nineteen-page research bulletin which answers current questions regarding various copy themes and treatments. It may be purchased for ten cents per copy from the Division of Research, National Better Business Bureau, Inc., 405 Lexington Avenue, New York.

STOP—LOOK—LISTEN

Are you getting the proper share of the retail powder business?

Wide awake exterminators meet their overhead by filling our Insect Powder Blowers and selling direct to the consumer.

The investment is small, the profits large.

A trial order will convince you.

Thos. W. Houchin Corp.
87 Ferry Street Jersey City, N. J.

"GOOD" DISINFECTANTS

Pine Oil Disinfectants Coefs. 3 and 4
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All made under careful laboratory control. Phenol coefficients determined by LaWall and Harrisson Laboratories.

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LOCAL ORGANIZATION NEWS

California Pest Control Association, Inc.

District 6 and 7 Hold Joint Meeting.

E. O. Corson, new member of the Structural Pest Control Board, was appointed just in time to be invited to the joint meeting of the two San Francisco Bay groups at Angelo's in Emeryville, the evening of August 14. He told the group that he would learn more about his job before he told what he proposed to do.

C. H. Menard discussed the coming convention of the National Pest Control Association in San Francisco, October 27, 28 and 29, and received suggestions from the group as to appointments for various committees. V. H. Montgomery asked for assistance in selling booths at the convention.

Bill and Mrs. Hogan were present, having arrived during their vacation trip to the Pacific Northwest. Mrs. Hogan was able to take part in the Women's Auxiliary meeting which was held following the dinner. The women are carrying on extensive planning for entertainment of guests at the convention.

Sincere sympathy is extended to J. E. McNatt who got cheated out of his vacation. He had just finished loading his car when he dropped a package on his foot, breaking a bone, which kept him at home for the duration.

Sympathy is also in order for Allan Vincent of Oakland, who broke an ankle recently, but since he was able to take his planned vacation trip to the Sierras we do not feel quite so badly about him.

Word from Allen Mathews, Registrar, is that a meeting held by the Structural Pest Control Board in Los Angeles and San Diego on July 29, 30, 31 and August 1, 1941, the following officers were elected for the 1941-42 fiscal year:

President—Mr. John H. Martin, San Diego.
Vice-President — Mr. R. L. Moore, Sacramento.

Regional Meeting of Antimite Representatives at Springfield, Ohio

Antimite representatives from the central territory, as well as some from the East, held a very interesting meeting on July 17-18-19 at the Bancroft Hotel, Springfield, Ohio.

The meeting was conducted by Mr. Arthur Ochs, St. Louis representative of the Antimite Company, and also Mr. H. R. Isherwood, the Indiana representative for that company.

One of the high lights of this meeting was the treatment of a small residence under the ANTIMITE SYSTEM OF TERMITE CONTROL. It was arranged thru the Springfield, Ohio, representative, Mr. Carl Romig, to have all of the men present during the treatment.

The meeting was very well attended and thru the help of Mr. Louis Gatto a group picture was taken of those in attendance:

Standing, left to right: Louis Gatto, H. E. Moffet, Carl Romig, F. E. Harder, R. C. Yeager, Ray Frederick, J. V. Benschoter, Clyde Meadows, R. W. Allen, Wm. Schuman and James M. Beam.

Seated, left to right: Clarence Custer, J. Hedrick, Earl Custer, Svend Nielson, H. R. Isherwood, Arthur Ochs, W. C. Whelen, E. A. Merrick, J. D. Pelot and Joseph Kopf.

Rats Reason Like Humans, Says Catcher

Pied Piper Takes Advantage of Shrewdness to Exterminate Them.

MILWAUKEE—A modern Pied Piper has inflicted some 9,000 casualties among the rat population of Shorewood, Milwaukee suburb.

The hero is Daniel Robertson, exterminator, who proceeds on the theory that rats think like human beings and display unbelievable shrewdness in their pillaging expeditions.

Robertson's theory worked in Shorewood and soon a neighboring community complained of a rat infestation. He accepted this fact as further proof of his contention that rats reason like people.

"Suppose you had been away on a visit and returned to find bodies strewn about the street," he said. "You'd naturally come to the conclusion that a terrible plague had struck the town. And you would leave as quickly as you could. It's the same way with rats. They decided that Shorewood was an unhealthy place and moved out.

Rat Uses Tail As Tow Rope

Another Robertson story concerns the commission merchant who complained that rats had been stealing eggs from his storeroom altho the chamber was protected by a metal, ratproof door. A close study revealed that the pillagers came out of the ceiling and ran down a pillar. But how did they carry the eggs back up the pillar? Ordinarily a rat would cradle the eggs in its front paws and hop along on its hind legs. But going up a pillar with the egg was a more complex problem.

So Robertson and an assistant concealed themselves in the storeroom one night to watch. Robertson said the female rat grasped an egg in her front paws and took her mate's tail in her mouth. Then the male scrambled up the pillar, towing the female with the egg in her paws.

Rodent Family Walks Tight Wire

Robertson tells another story of a rat-infested house. The dwelling apparently was ratproof but one entrance had been overlooked by the owner. Leading from the barn to the house was a double strand of wire, eighty-seven feet long, that entered the house thru a small hole. However, reaching the hole should be too much a task for even an ambitous rat. But while Robertson watched one night he saw a whole family of rats trip daintily across the eighty-seven feet of wire from the barn and go into the house without a single slip.

Robertson even suspects that rats have a language and converse with each other. He says he often has placed food near a colony of rats. First three or four would come out to nibble at the offering. Then they would return to their holes, and an hour or two later the whole colony would be out feasting.—*Denver Post.*

Cobweb

The spider swings from shelf to shelf
And spins a web out of himself,
A subtle net to catch a fly,
Or else the housewife's wary eye.
Richard Armour.

—*N. Y. Sun.*

WHAT'S NEW IN PEST CONTROL-PERSONALS

Captain David Castle of San Francisco, Calif., has resigned as a member of the California Structural Pest Control Board due to his being called by the Navy. In the last World War, Castle was a Lieutenant Commander. His work on the Structural Pest Control Board has been appreciated by the industry of California.

Found roaming around Lake Morey, at Fairlee, Vermont, were Dr. and Mrs. Thos. E. Snyder, who report a very pleasant vacation. Dr. Snyder is looking forward to participating as one of the speakers at the Ninth Annual Convention to be held in San Francisco, Calif., October 27-28-29.

Retorts George R. Elliott of Worcester, Mass., in writing to Louis Kotler of Memphis, Tenn.—"Hot, you ask? It has been, plenty, all summer until this week. Then it dropped from 83 to 45 in one day, and has been late fall weather since. But what we New Englanders are worried about is the threat to cut off our Saturday night Baked Beans. (You guessed it—gasless Sundays.)" And speaking of George, he as well as Charlie Houghton and Bart Eldredge did the honors on the recent Anniversary Honeymoon of Helen and Bill Buettner accompanied by Billy as the itinerary covered Yarmouth, N. S., and such way points as the Lief Erickson rock, Plymouth and the Way Side Inn at South Sudbury. And in this cryptic style George writes to Walter McCloud, "I was thus able to make my first annual check-up, and without going into detail it appears that the first year of matrimony has worked no visible hardship on any of 'em. Considerable unfinished business came in for attention."

The Seventh Housing Project of New York City, Kingsboro Houses, is being treated just as the previous six; namely mass fumigation with cyanide gas. The newspapers reported 140 families moving into the latter project on August 18th and once the furniture was placed in the rooms, the Guarantee Exterminating Co. of New York City took over the buildings for fumigation.

Forthcoming Convention: National Restaurant Exposition is to be held October 6-10, at the Furniture Mart, Chicago, Ill.

CHIP OF THE OLD BLOCK: Billy Buettner, Jr., calls attention to a recent magazine cartoon. It depicts a woman alarm-clocking her husband out of his slumbers, who though still half asleep says: "SO YOU HEAR THE SQUEAK OF A MOUSE! WHAT AM I SUPPOSED TO DO—OIL IT?" To which rejoinder Bill, Jr., replies with apropos humor and a youthful eye on the main chance which augurs well for the future: "NO! CALL AN EXTERMINATOR!" Not bad! Not bad!

BORAX MAY BE REMOVED FROM PRIORITY LIST. According to a recent article in the N. Y. Herald-Tribune, borax is about to be removed from the priority list. the first defense shortage to be remedied.

According to a recent sports item the N. Y. Yanks have a set of Japanese beetle traps in their dugouts. Sort of an addition to their fly-catching activities, we suppose.

MILL PESTS: The main pests in a mill to be eradicated by fumigants are the Mediterranean flour moth, the flour beetle, the grain beetle, and the pea and bean weevil. They infest, unless proper control methods are carried out, grain products, milling machinery, elevating housing, and even the walls and partitions in the mills and warehouses themselves.

—*American Miller.*

A crowd gathered to watch, at a safe distance. The only person brave enough to approach the bees, and to even poke around in the swarm for the queen, was Patrolman Louis Miller. He didn't get stung, but some of the onlookers had a hopeful look in their eyes. Eventually an apiarian was summoned to induce the swarm to retire to safer quarters; for themselves and the crowd.

Seems to us like a clear case of bees rushing in where bees should fear to tread —or something.

QUIZ QUESTION: EVER HEAR OF A RAT RACE? In Army parlance it is a mounted review.

W. E. McCauley, for four years assistant entomologist with the State of Illinois Natural History Survey, has resigned to accept the position with the Velsicol Corporation, 3542 North Kimball Avenue, Chicago, Illinois, as Manager of their Insecticide Division.

Mr. McCauley has been in direct charge of the research and educational program of the Survey pertaining to household and industrial insect control, and has also done work in the field of animal parasite control. He is well known for his cooperative work with the rapidly growing pest control industry.

The Velsicol Corporation is a substantial chemical manufacturer, specializing in petroleum derivatives, and has recently established an insecticide division to handle certain of its materials for use in the field of insect control, particularly against livestock, household, and industrial pests. These synthetic products, made by a new process, are totally different from insecticides heretofore used, and already show great promise, either used alone or in conjunction with other insecticides.

FEDERAL ENTOMOLOGISTS SAY: "Empty return sacks and barrels are great carriers of mill and grain insect pests in larvae and adult stages." This is one of the main causes of mill infestation. Many mills maintain special departments for fumigating containers.

—*American Miller.*

If a man's strength was proportionate to a mole's, he'd lift 6,000 pounds.

THALLIUM SULPHATE

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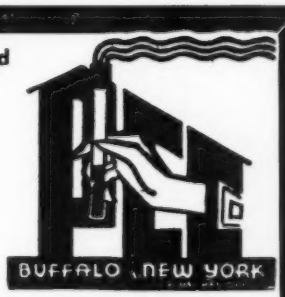
Var-Lac-Oid Chemical Co.

116 BROAD STREET - NEW YORK, N. Y.

Thallium-Impregnated-Seed
10 lbs.—$4. 25 lbs.—$7.
50 lbs.—$12. 100 lbs.—$20.
For the extermination of mice

Phosphorus Paste
10 lbs.—$4.25. 25 lbs.—$9.
50 lbs.—$17. 100 lbs.—$32.50.
For the extermination of rats and roaches

Bird Repellent
10 lbs.—$6. 25 lbs.—$13.50.
50 lbs.—$25. 100 lbs.—$45.
Keep buildings free of roosting birds



PEST CONTROL CHEMICALS CO.

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Trends of the Times

THE city of Chicago was infested by rats. River basements and slum attics generate rats. Dirt and decay and places wanting light and air are heaven for rats. There was dirt and decay in Chicago, and rats! As in old Hamelin town 500 years ago:

They fought the dogs and killed the cats,
And bit the babies in their cradles,
And ate the cheeses out of the vats,
And licked the soup from the cooks' own ladles,
Split open the kegs of salted sprats,
Made nests inside men's Sunday hats,
And even spoiled the women's chats
By drowning their speaking
With shrieking and squeaking
In fifty different sharps and flats.

The people of Hamelin dealt with their rats in their own historic way. The people of Chicago followed the modern, scientific way. There were two rats in Chicago for every human being there, five or six million in all. Each rat was doing a damage of $1.40 a year. It wouldn't do.

There being no pied piper, as in Hamelin, at hand, Chicago called in the WPA.

Everybody grumbles about the WPA. Everybody, when he wants a hard and dirty job done, like clearing Chicago of its rats, calls on the WPA.

When people get typhoid now they send for the doctor; but the doctor doesn't get much sent for.

Reason, there isn't much typhoid. The reason for that: the people, when anyone gets typhoid, look for typhoid's source—the typhoid fly, the infected water and milk and all the rest. They remove the cause. Thereby typhoid grows rare now where it was common before.

The human race had come to the twentieth century, A.D., before it stopped blaming its diseases to God and went to cleaning up itself. How God has helped us, once we helped ourselves!

Out went typhiod, yellow fever, malaria and "summer complaint." That came of helping ourselves by removing the causes of afflictions, such as these.

The sustenance of many a rat is the open or absent garbage pail. Chicago taught its people to put their garbage in metal pails and keep the cover on. This was most discouraging to the rats. Rats must eat or die.

The lack of garbage for rats to fatten on made more effective the next step against the rats. There are poisons which rats like better than red squill, but none less dangerous to other things than rats. Chicago put 1,800 WPA workers to spreading poison where hungry rats were apt to be.

Ward by ward the WPA workers wrought. They spread the poison; the rats ate it and went home to their holes to die. The WPA then stopped up the holes.

If the hole stayed stopped, it was a sign the rat was ended there. If a new hole appeared, then more red squill.

By the hundreds of thousands and by millions the rats succumbed. The worst infested of Chicago's wards were freed, in a few weeks' time, of rats. Thanks to intelligent action that struck at causes, Chicago, at no great expense, is now a ratless town.

A labor for a Hercules has been done.

Ratless town?

As to quadruped rats. More dangerous in Chicago and everywhere, are rats of another breed.

"Knifey" Sawicki is a rat.

This "rat" began playing with guns in the fifth grade at school. He was "mighty handy," too, with a knife. This should have marked him as a rat.

For his rat work he was early sentenced to an institution for dangerous boys. The authorities turned him loose.

Never a rat of those it caught did the Chicago WPA parole. Young Sawicki, still a rat, was paroled.

He returned to his gun. He shot the farmer whom he blamed for his conviction as a rat. In Chicago he held up John J. Miller who resisted and was shot. He killed a policeman; then wounded a pal.

Now the rat which the parole board mistook for a man awaits his sentence from a court. Will the rat be loosed again?

Chicago's four-legged rats rob the garbage cans, gnaw at the walls. Without mercy they are caught, then killed.

Chicago's two-legged rats are turned loose again to rob and kill as no four-legged rat could do.

WALTER LOCKE.

John James Dies

Was First in Field to Employ Timbo Root; Used to Kill Fish by Indians of Brazil

Insecticide manufacturer, John James, 55, died on July 31 at his home in Sayville, L. I.

Mr. James was born in San Antonio, Texas. At an early age he started in railroad construction work in Mexico. In 1907 he had charge of clearing the right of way for the Madeira-Mamore Railroad through the Brazilian jungles.

It was 1911 before he finished that job. Then he went in for rubber planting and cattle raising. In 1932, when the rubber industry of Brazil was in a decline, Mr. James returned to the United States. One of the purposes of his trip was to find a market for some South American product.

For some years scientists had been experimenting with poisonous roots used by natives to kill fish. In some isolated instances the substance had been found useful in ridding sheep of ticks and killing bugs on grape vines. It had not come into commercial use and the scientists were still somewhat uncertain about its properties.

Mr. James did not know anything about experiments, but he knew the plant used for fish-killing by Brazilian natives. It grew lavishly beside the very streams the natives fished. They pounded the roots to shreds and then swished them through the water. Within a few minutes the water was covered with dead fish.

At the Department of Agriculture Mr. James learned that the poisonous substance was called rotenone and promised to be of immense value if it could be obtained in quantity. It was fatal to insects, did not hurt human beings and was disintegrated by sunlight within a few hours after being sprayed on plants.

Mr. James went back to Brazil, set up a factory and began buying and processing the roots of the plant, which is called the timbo. It was two or three years before the quality of the insecticide was appreciated, but in his third year he sold 2,000,000 pounds and began setting out timbo plantations, realizing that the drain on the wild plants might cause a shortage.

Surviving are his wife, Mrs. Elinor James; a daughter, Miss Elinor Oxholm James; a brother, Lieutenant Colonel Denton Lee James, U. S. A.; four sisters, Mrs. Bettina Groos, Mrs. Fillis Pickett, Mrs. Lucille Hartwell and Miss Agnes James; his step-mother, Mrs. Mary R. James; a half-brother, Theodore James, and a half-sister, Mrs. Laura Edge.

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7700 Carnegie Ave., Cleveland, Ohio

Additional Patents Relating to Pest Control

By DR. R. C. ROARK

EDITOR'S NOTE: *This service is provided through the Department of Agriculture for the purpose of bringing to the attention of those interested such matters that may be of assistance to the industry. The Department of Agriculture assumes no responsibility for the merits or workableness of of any of the inventions mentioned. Copies of all patents can be obtained for 10c (no postage stamps) sent to the Patent Office, Washington, D. C. When placing orders be sure to note the number of the patent, the date, the name of the patentee and the subject of the invention.*

Re. 21791 (Reissued May 6, 1941; appl. Aug. 2, 1940; original No. 2,139,225, dated Dec. 6, 1938). TERMITE REPELLENT. Newton P. Easling, Pekin, Ill.—The E. L. Bruce Company, Memphis, Tenn.—This termite repellent is formed of felt paper.

2,240,754 (May 6, 1941; appl. April 13, 1938). ANIMAL TRAP. Charles D. Briddell, Crisfield, Md.; Evelyn Andrews, Charles D. Bridell, Jr., Thomas H. Briddell, and Willis H. Briddell, executors of Charles D. Briddell, deceased—Animal Trap Company of America, Lititz, Pa.

2,241,019 (May 6, 1941; appl. Jan. 15, 1940). PRODUCTION OF ETHYLENE OXIDE. Floyd J. Metzger, New York, N. Y. —U. S. Industrial Alcohol Co., New York, N. Y.—The patentee claims the method of increasing the efficiency of the cyclic method of oxidizing ethylene catalytically which comprises directing a gaseous mixture containing ethylene and oxygen over a catalyst separating the resulting ethylene oxide from the gaseous mixture, selectively absorbing ethylene from the portion of the residual gaseous mixture which is not cycled, purging the gas from which ethylene was selectively absorbed, adding make-up ethylene and air to the cycled gaseous mixture, and flushing the absorbed ethylene with the air to be added to the cycled gaseous mixture to transfer to said air the absorbed ethylene.

2,241,400 (May 13, 1941; appl. Dec. 18, 1939). PROCESS OF PRODUCING WOOD PRESERVATIVE. Jacquelin E. Harvey, Jr., Cogdell, Ga.—One-half to Southern Wood Preserving Company, Atlanta, Ga.—The patentee claims in the enhancement of toxicity induction in a mixture of tar fractions boiling preponderantly above 270° C., the process which comprises: subjecting said mixture of tar fractions to the action of a supply of hydrogen in excess of that combinable by the process, at a temperature in excess of 200° C. and a pressure in excess of atmospheric; carrying on the process for such a length of time as to provide fractional increment having increased toxic properties and boiling below 270° C. in excess of fractional increment having increased toxic properties and boiling above 270° C.

2, 241,948 (May 13, 1941; appl. Mar. 9, 1939). ANIMAL TRAP. Hershey Roy Graybill, Manheim, Pa.—Animal Trap Company of America, Lititz, Pa.

2,242,098 (May 13, 1941; appl. July 15, 1939). INSECT TRAP. George G. Wittwer, Chappaqua, N. Y., and William M. Stieh, Teaneck, N. J.—Lethelin Products Co., Inc., Mount Vernon, N. Y.

2,242,099 (May 13, 1941; appl. July 13, 1939). ANT TRAP. George G. Wittwer, Chappaqua, N. Y., and William M. Stieh, Teaneck, N. J.—Lethelin Products Co., Inc., Mount Vernon, N. Y.

2,242,266 (May 20, 1941; appl. Feb. 21, 1940). TERMITE SHIELD CONNECTOR. Walter H. Scales, New Orleans, La.—Timber Engineering Company, Washington, D. C.

2,242,648 (May 20, 1941; appl. Sept. 3, 1940). ANIMAL TRAP. Joseph La Rocca, Cleveland, Ohio.

2,243,207 (May 27, 1941; appl. Apr. 18, 1940). INSECTICIDAL COMPOSITION. Edward Harvill, Yonkers, N. Y.—Boyce Thompson Institute for Plant Research, Inc. —An insecticidal composition comprises a mineral oil base, 0.05 to 0.1 percent pyrethrum, 1 to 2 percent orthocyclohexyl phenol and a secondary organic solvent soluble in the mineral oil base and in which orthocyclohexyl phenol is soluble.

(Continued on page 34)

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PESTS, Cut Dept

512 East 14th St. Kansas City, Mo.

2,243,479 (May 27, 1941; appl. Feb. 24, 1939). INSECTICIDE. William F. Hester, Drexel Hill, Pa.—Rohm & Haas Company, Philadelphia, Pa.—An agricultural insecticidal composition adapted for use on living plants comprises a compound from the group consisting of phenyl benzyl ether, phenyl benzyl ethers having an alkyl substituent on the phenyl group, and phenyl benzyl ethers having an aromatically bound nitro group, said compound having at least one halogen substituent of a relative weight above thirty attached to an aromatic ring.

2,243,543 (May 27, 1941; appl. Oct. 14, 1938. PARASITICIDE. William P. ter Horst, Packanack Lake, N. J.—United States Rubber Company, New York, N. Y. —A parasiticidal preparation contains as an active constituent a composite oily to resinous distillable product resulting from condensing an aromatic compound selected from aromatic hydrocarbons and nuclear-halogen substitution products thereof with an alkylene halide.

2,243,752 (May 27, 1941; appl. June 15, 1940). LIQUID VAPORIZING AND DIFFUSING DEVICE. Sanford J. Dunaway, Dover, N. H.—The Expello Corporation, Dover, N. H.

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